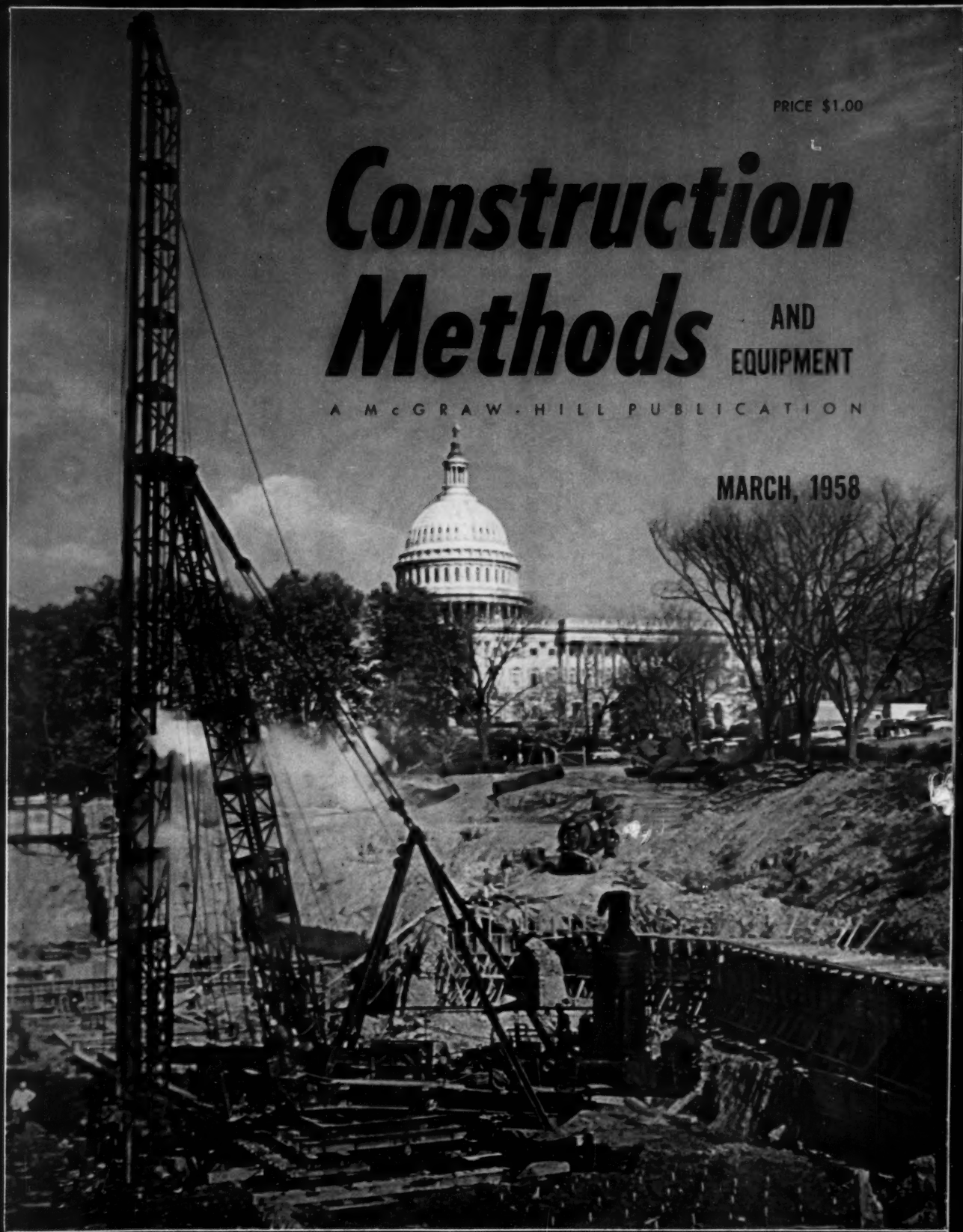
PRICE $1.00

Construction Methods AND EQUIPMENT

A McGRAW-HILL PUBLICATION

MARCH, 1958



Pile driver working across the street from the Capitol drives piles for foundation of addition to the House Office Building in Washington, D.C.

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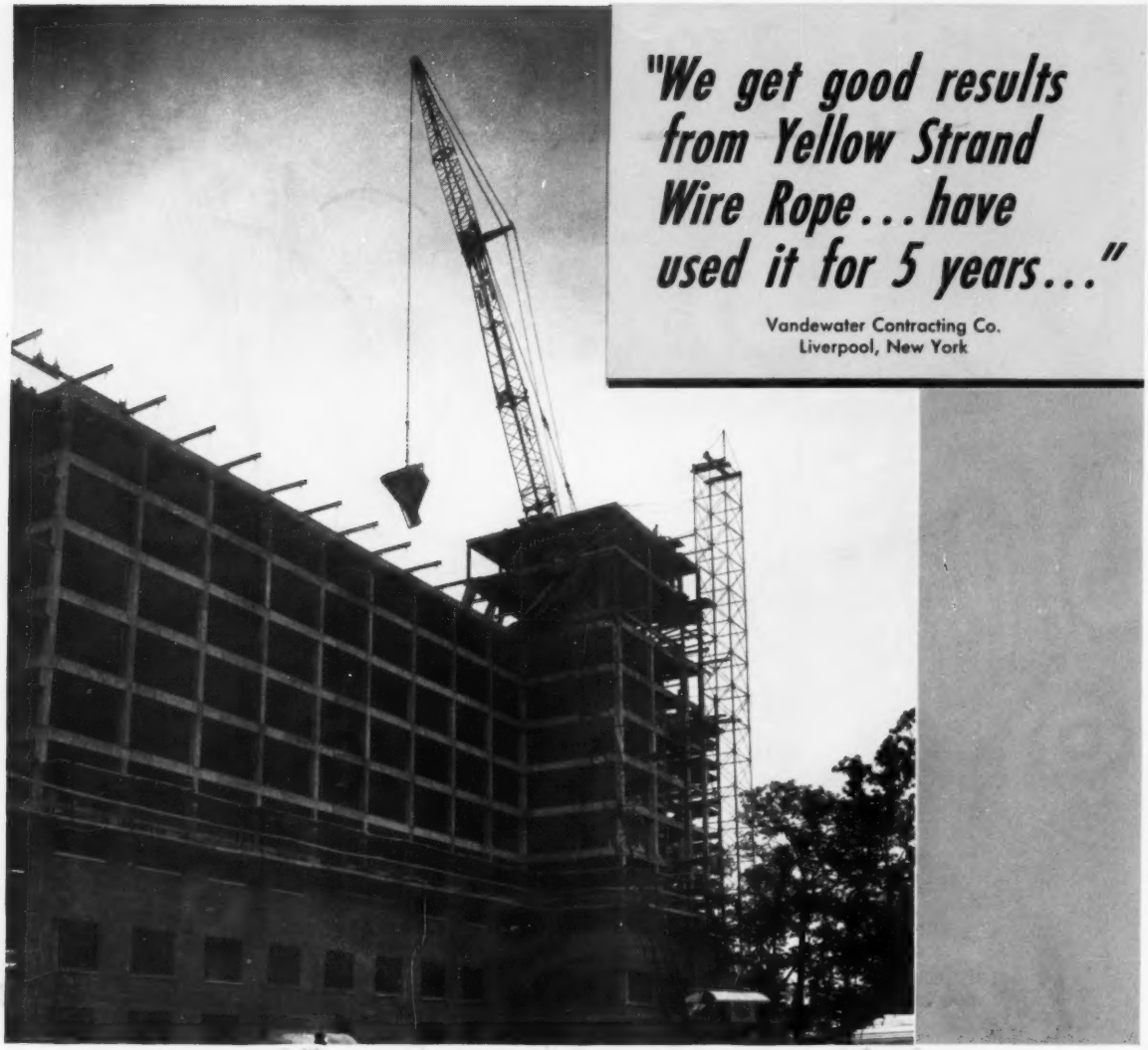


"We get good results from Yellow Strand Wire Rope... have used it for 5 years..."

Vandewater Contracting Co.
Liverpool, New York

One of Vandewater's cranes is shown lifting a skip of concrete to complete pouring on the new $3,000,000 women's dormitory at Syracuse University, Syracuse, New York.

1″ non-spinning Yellow Strand is used on the skip line and ⅞″ and ¾″ Yellow Strand is used elsewhere. The crane carries a 145′ boom and loads on this job go up to 15,000 lb.

President of the firm, Wm. J. Vandewater, says, "We have used Broderick & Bascom Wire Rope for the past five years with good results."

Construction men prefer Yellow Strand Wire Ropes for many reasons. They're tough, strong and resistant to wear. A type is available for every use, including Flattened Strand and Extra High Strength Yellow Strand "POWER-STEEL." All B & B Wire Ropes are tops for quality materials and precision manufacture. Another big, important advantage: Wherever your job, Yellow Strand is always near at hand. Your B & B Distributor will help you select the right wire rope for your equipment. Call him today for his expert service. Broderick & Bascom Rope Co., 4203 Union Blvd., St. Louis 15, Mo.

Yellow Strand®
Wire Rope

B.F.Goodrich

New Rock Service Tubeless tires speed highway construction for contractor

CKG ASSOCIATES put 115 pieces of equipment on the job to speed completion of the Northern Illinois Toll Road near Elgin. Trucks, tractors, earthmovers, cement-mixing machines —all work 12 hours a day, 6 and 7 days a week. Helping this equipment stay on schedule are 8 different types of B.F.Goodrich tires, headed by the new Rock Service Tubeless. Fast, expert on-the-job tire service given by the local B.F.Goodrich dealer is one reason for this choice.

Another is outstanding tire performance. The new B.F.Goodrich Rock Service tire is built to its inflated shape. The whole tire flexes evenly—no *localized* stresses that often cause unnecessary tire failure. The B.F.Goodrich FLEX-RITE NYLON cord body withstands double the impact of ordinary cord materials, resists heat blowouts and flex breaks. Result: more retreadable Rock Service tires.

The Rock Service double chevron tread gives maximum traction. Rugged sidewalls defy rock bruises. And B.F.Goodrich Tubeless construction protects against punctures, cuts maintenance costs, is easier to service. Tires run cooler.

See B.F.Goodrich Rock Service Tubeless or conventional tires at your nearby B.F.Goodrich dealer's. He has a money-saving tire for every construction job. *B.F.Goodrich Tire Co., A Division of The B.F.Goodrich Co., Akron 18, Ohio.*

THERE'S A B.F.GOODRICH TIRE FOR EVERY CONSTRUCTION JOB

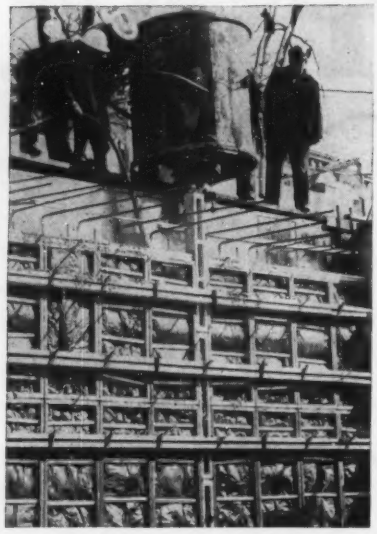
UNIVERSAL | ROCK LOGGER | SUPER TRACTION | TRACTION EARTH MOVER | ROCK SERVICE

Specify B.F.Goodrich Tubeless or tube-type tires when ordering new equipment

Smileage

Your B.F.Goodrich dealer is listed under Tires in the Yellow Pages of your phone book

Insulated Forms

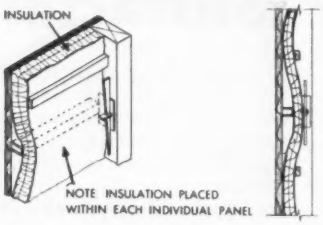


Symons Forms and Balsam Wool Insulation

Save 50% on Cost of Heating & Curing Concrete

C. R. Meyer & Sons Company, Oshkosh, Wisconsin posted this record 50% savings on the new $1,000,000 central office building of the Wisconsin Telephone Company at Oshkosh. Two-inch insulation in 24-inch widths was tacked to the forms. Walls were 12 inches thick and varied in height from 12 to 16 feet.

Pouring was started in January. Temperatures ranged from five to 25 degrees above zero. Concrete at time of pour was held in the 70 to 80-degree range. During one pour a



Cutaway section of form with insulation

tube was cast in the wall four feet from the top with a thermometer suspended in the bottom. After 24 hours, temperature at center of concrete rose to 105 degrees and after five days the concrete went back to 70.

Symons forms, shores and column clamps may be rented with purchase option. FREE literature on Symons' products is available upon request.

Symons

SYMONS CLAMP & MFG. CO.

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Chicago 39, Illinois

Construction Methods AND EQUIPMENT

MARCH, 1958

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ONE OF A SERIES of advertisements to help the construction industry get better service from wire rope.

SHOVEL Chain, Electric, or Steam Crowd
1, 2, 3, Part or Twin Main Hoist Line

DIPPER LATCH LINE

6 x 36G PREformed Regular Lay Whyte Strand Fiber Core
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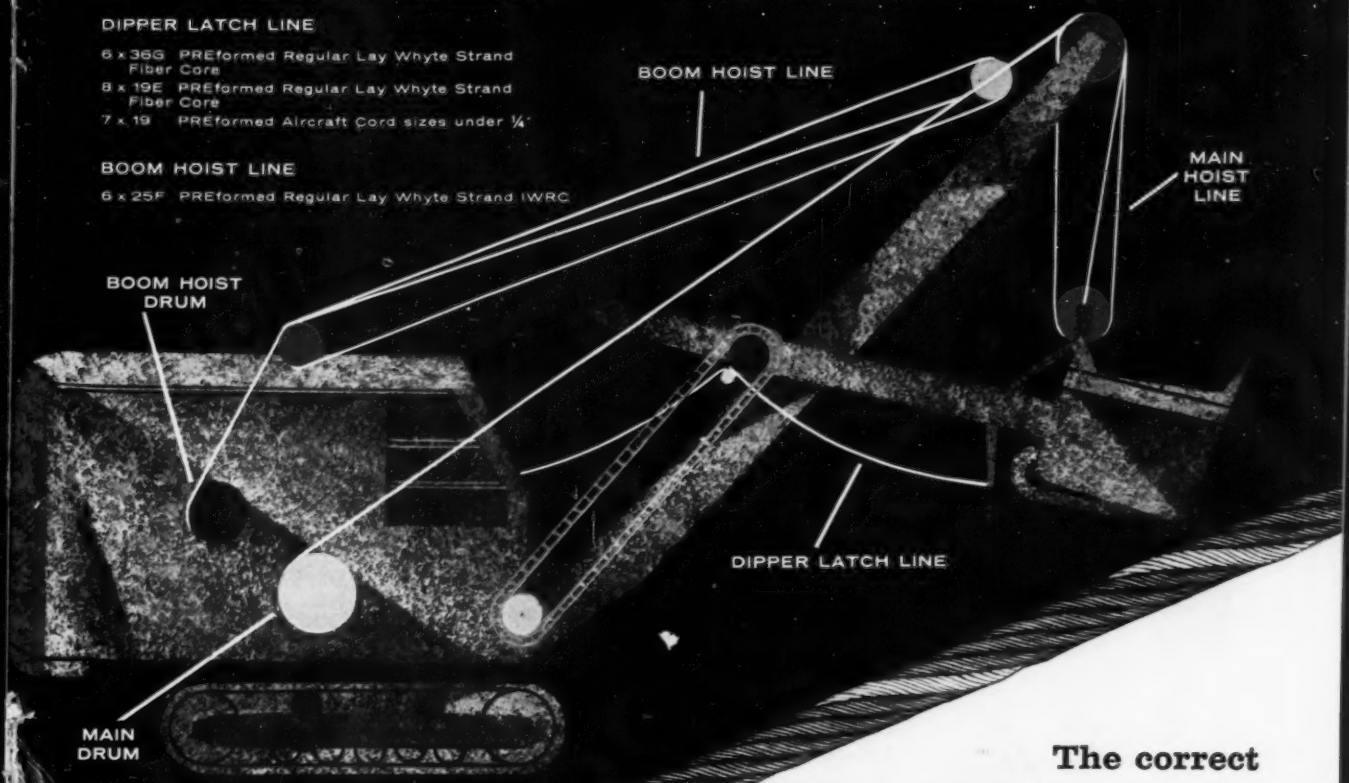
BOOM HOIST LINE

6 x 25F PREformed Regular Lay Whyte Strand IWRC

MAIN HOIST LINE

⅛" and ¾"	6 x 25F PREformed Lang Lay Whyte Strand IWRC 6 x 25F PREformed Regular Lay Whyte Strand IWRC
⅞" and Larger	6 x 25F PREformed Lang Lay Whyte Strand IWRC
*1" and Larger	6 x 41F PREformed Lang Lay Whyte Strand IWRC

*Where sheaves or drum diameters are less than 22 times rope diameter.



The correct Macwhyte wire rope will lower your yearly rope costs

You will make substantial savings in the amount of money you spend every year on wire rope for shovels — or any other equipment — if you use the right *type* of rope designed for your job.

Shown above are correct recommended wire ropes for use as main hoist line, dipper latch line, and boom hoist line on power-shovels. Each of the Macwhyte wire ropes listed is designed to shrug off the normal abuse, strain, and abrasion encountered in shovel service, and to offer exceptional service life.

Whyte Strand wire ropes are PREformed to eliminate any internal stresses in manufacture. This is particularly important in shovel service, where rough use and reverse bends subject *any* wire rope to severe flexing and bending strains as it curves around sheaves and drums.

In addition, every inch of Whyte Strand wire rope is internally lubricated. As the rope flexes, this enables adjoining wires to move by each other without wear, and extends the life of the rope. The tenacious lubricant also protects the exterior strands against moisture and corrosion.

Reeve up your shovels with Whyte Strand wire rope and watch rope costs drop! 103

MACWHYTE Wire Rope COMPANY

MACWHYTE WIRE ROPE COMPANY
2906 Fourteenth Avenue, Kenosha, Wisconsin

Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal, Stainless Steel Wire Rope, and Wire Rope Assemblies. Special catalogs available.

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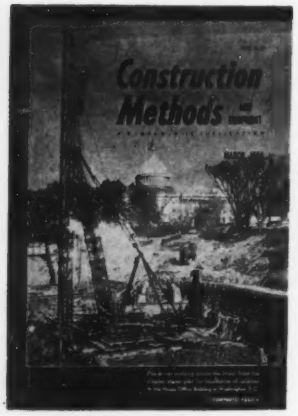
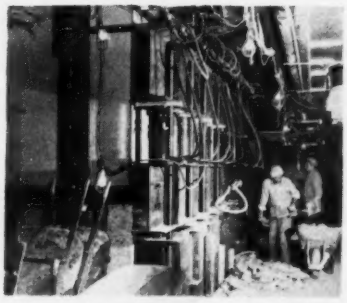


ON THE COVER

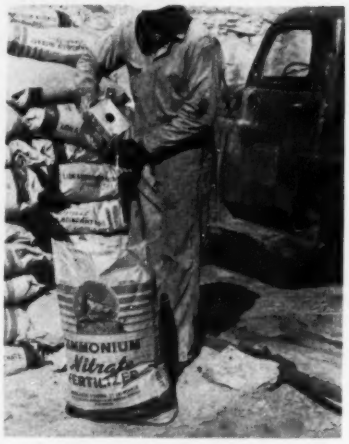
Trestle-riding pile rig drives steel shells for cast in-place concrete piles that will support a $2-million addition to the House of Representatives Office Building in Washington, D. C. Raymond Concrete Pile Co., foundation subcontractor to Gunnell Construction Co., put the pile driver together for the job. See story beginning on page 170.

Pay Dirt in This Issue



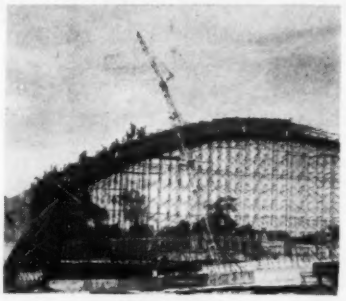
Hydraulic Jacks Lower Heavy Vault to Basement 84

While work in the bank continues as usual, a contractor picks up a 600-ton vault and lowers it 13 ft from the first floor of the building to a new foundation in the basement.



New Blasting Agent Cuts Powder Costs 130

Pour fuel oil over ammonium nitrate and the result is an explosive that costs 75% less than standard powder. Although the mixture has drawbacks, it has proved to be safe, cheap, and effective for most surface blasting when used properly.



Scaffold Towers Support Forms for Arch .163

Adjustable tubular scaffold towers reach up 70 ft to support forms for a concrete arch that is the backbone of a new building on the campus of Yale University in New Haven, Conn.

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NEXT MONTH

Two casting yards turn out precast framing members and roof panels for the $7.5-million Farmers Market in Atlanta, Ga. Vacuum pumps pull moisture from the concrete mix so that members are ready for erection 48 hr after casting.

Rough Going Doesn't Faze **Gorman-Rupp Lightweight Pumps**

Mud and frozen chunks of dirt won't stop this pump. It's a Gorman-Rupp "80" Series. Straight-in suction delivers liquid directly to the impeller's eye. No entrance restrictions. No check valve. Capacity, efficiency and suction lift are increased.

Gorman-Rupp "80" Series Centrifugal Pumps prime and reprime at lifts up to 30 feet. They are easily moved from location to location because of lightweight, aluminum construction. (The Midget weighs only 48 pounds.)

Available in four models:

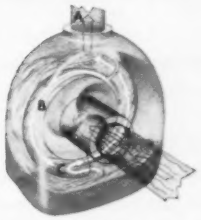
Midget, 1½", 6,500 GPH, 2.25 HP
Pelican, 2", 8,500 GPH, 2.75 HP
Hawk, 2", 12,000 GPH, 5.5 HP
Eagle, 3", 18,000 GPH, 6.8 HP

Ask your Gorman-Rupp Distributor for a demonstration.

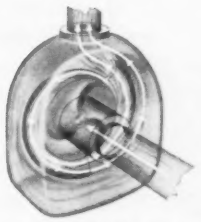
NEW PRIMING PRINCIPLE

introduced at the Road Show

PUMP AT REST—Captured liquid retained for priming. Note absence of usual check valve.



PRIMING ACTION—Entrained air (B) escapes at (A) to be discharged. Priming liquid returns (C) to entrain more air.



PUMPING ACTION—Straight-in suction voids entrance restrictions. Water enters direct to the eye of the impeller.

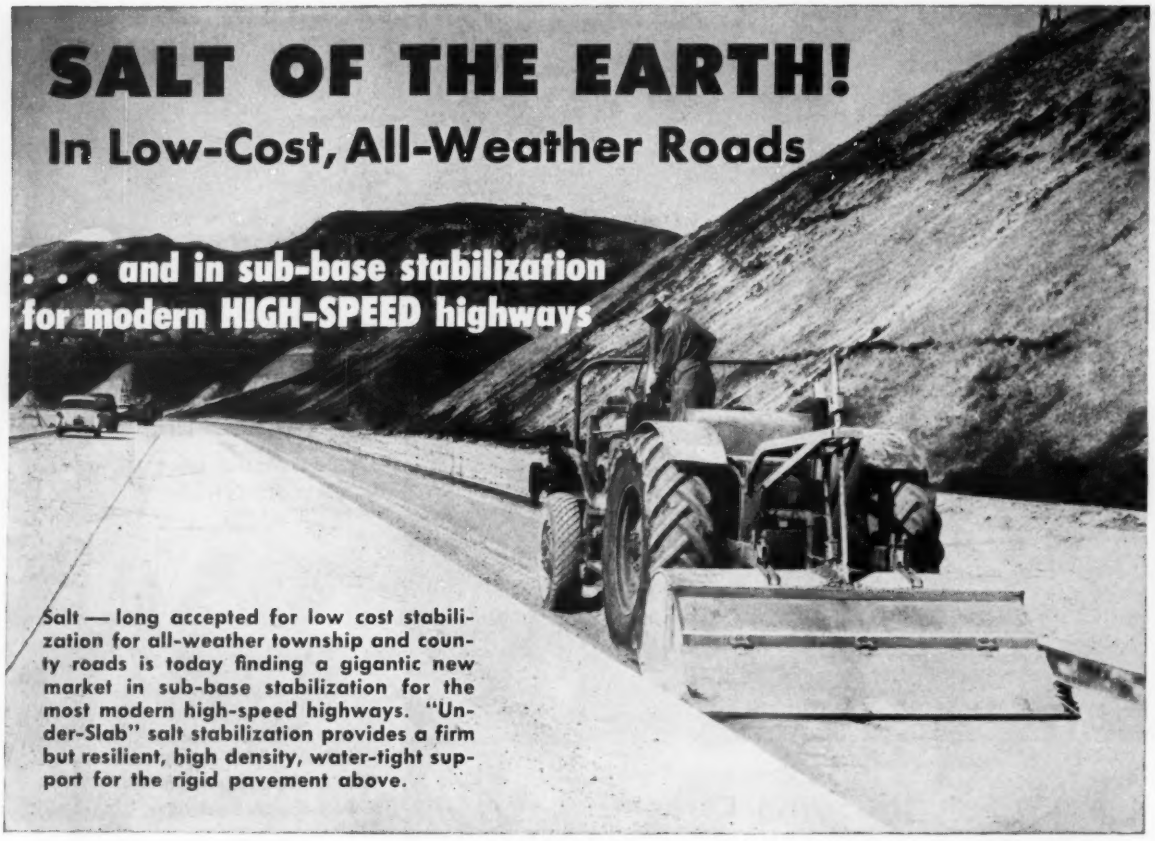
THE GORMAN-RUPP COMPANY

305 Bowman Street • Mansfield, Ohio

SALT OF THE EARTH!

In Low-Cost, All-Weather Roads

. . . and in sub-base stabilization for modern HIGH-SPEED highways



Salt — long accepted for low cost stabilization for all-weather township and county roads is today finding a gigantic new market in sub-base stabilization for the most modern high-speed highways. "Under-Slab" salt stabilization provides a firm but resilient, high density, water-tight support for the rigid pavement above.

The Mixing Method — The Pulvi-Mixer

Virtually no other method today is employed for high quality mixing in salt-stabilized farm-to-market native soil or gravel roads. The Seaman-Andwall Pulvi-Mixer provides the greatest advantages in low cost sub-base stabilization:

1. The Pulvi-Mixer mixes and blends the salt to complete depth and at the same time blends coarse aggregates and fines so that — after compaction the mix is closely knit, voids are well filled and aggregates securely interlocked.
2. Usually the Seaman-Andwall mixing process costs about a cent a square yard — often less; little enough to build a durable, low-maintenance all-weather road — and certainly little enough to protect the huge investment involved in major highway construction. The cost is far less, production is greater and uniformity higher than with the old fashioned multiple pass operations with a blade.

Spreading

The most efficient spreading equipment for the original salt application is found to be either the Century HY-4 or the Century HY-8. Both are tailgate spreaders, operate hydraulically with only one man (the truck driver) and both meter salt with high accuracy.

Recommended for compaction immediately after the Pulvi-Mixer operation is the highly maneuverable Seaman-Andwall 7 to 20 ton Pneumatic Compactor. Compressive forces are "straight down" so the Seaman-Andwall Compactor prevents displacement of materials, scuffing, shearing or raveling of the surface.

Studies of salt stabilization costs show that this type of construction runs as low as $400.00 per mile.

If you would like to have a Bulletin on Salt Stabilization, send a post-card to Seaman-Andwall **Corporation — Dept. R-210 —** Milwaukee, Wisconsin. We will get complete information and literature to you promptly.

SEAMAN-ANDWALL CORPORATION, Milwaukee 1, Wis., U. S. A.

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Boom and Basic Machine travel to job on separate trailers.

ONLY 4 HOURS FROM START TO WORK!

Boom is fitted to basic machine.

WHAT is it costing you to move a 2½-yd. Shovel from job to job? How much is lost in time? Some machines in this capacity range, take up to two-days and require an extra crane.

Your Northwest 80-D, 2½-yd. Shovel can be reduced in weight for road travel and be on the job in a matter of hours. Northwest 80-D's have been dismantled, put over the road 20 miles and working on the job in 8 hours. The machine pictured, owned by the Consumers Company of Milwaukee, was dismantled, loaded on trailers, erected and on the job in only 4 hours.

Moving your Northwest 80-D is a simple operation. The boom is lowered to the truck or trailer bed and unbolted from the base. Cables and Crowd Drum are part of the boom assembly. Cables are coiled back on the boom. The basic machine backs out and loads itself on another trailer. The procedure is reversed on arriving at the job and the machine goes to work. Further reduction in weight can be had including removable counterweight on your Northwest. No crane is needed. Two men with ordinary tools can do the job! It is quick, easy and a real time and money saver. Another of the many Northwest advantages for making money for you. Ask for details.

Four hours later the Northwest is fully assembled and at work.

Always Ready to **GO**

NORTHWEST

NORTHWEST EQUIPMENT IS BUILT IN THE FOLLOWING SIZES

SHOVELS	CRANES	DRAGLINES	PULLSHOVELS	TRUCK CRANES
¾ Yd. to 2½ Yd. Capacity	13-Ton to 50-Ton Capacity	¾ Yd. to 3 Yd. Capacity	¾ Yd. to 2½ Yd. Capacity	25-Ton and 35-Ton Capacity

NORTHWEST ENGINEERING COMPANY
1503 Field Bldg., 135 South LaSalle Street, Chicago 3, Illinois

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Your driver spends a good two minutes every hour in phone hunting, parking and checking in regularly every day. By eliminating just this, your Motorola radio *pays for itself*—but that's not all. It saves time and money a dozen other ways. In fact, many users report that Motorola 2-way radio control saves them *an hour a day* and more for every truck! And they're glad they chose Motorola—for the pioneer and leader produces equipment that *performs better* and *lasts longer*. Add it up for yourself—you'll see why Motorola 2-way radio costs you nothing—actually *makes money* for you! Why delay any longer? Contact Motorola today.

IF YOUR DRIVER SAVES 2 MINUTES AN HOUR WITH RADIO

HERE'S THE PROOF

Even if your cost is as low as $5.00 an hour . . . $3.00 for the truck and $2.00 for the driver . . . saving as little as 2 minutes an hour* for each radio-equipped truck will more than pay for your Motorola 2-way radio system, including installation and maintenance. And after three years, the system is all yours!

*Based on ultra-conservative three year amortization schedule.

MOTOROLA *2-WAY RADIO*

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Construction News From Washington

Washington, D.C.
March, 1958

Fighting the Recession

Bigger federal spending on public works construction is everyone's answer to the hottest question in Washington: "What can the Administration do most quickly to pump out federal dollars to end the recession?"

Tax cut talk is coming up fast, too, and many experts say a cut is a certainty before Congress goes home this summer. But there's no doubt in anyone's mind that construction spending—on federal buildings, dams, reclamation projects, rivers and harbors, flood control, military projects—will be stepped up.

Administration officials from the President on down are committed to this kind of anti-recession spending. Republicans in Congress tend to ask for more than the Administration is willing to support at this time. The Democrats who control Congress want still more —and faster—than anyone else. Democrats are convinced that the recession offers them an issue to take to the voters this November, and they are riding it for all it's worth.

Of course, Pres. Eisenhower and his advisers may be right in their prediction that a real turn-up is only a few weeks off. But the list of experts who say that an upturn still is months away is impressive. And the longer the upturn is delayed, the bigger federal construction spending is likely to be.

Wielding the Construction Weapon

Release of $180-million of slum clearance funds signaled the start of increased federal spending on public works. Then came a lifting of the Budget Bureau ceiling on Corps of Engineer public works spending—a ceiling that would have held contractors to operating at levels below what Congress provided for the current year.

Most dramatic was the announcement of a $2-billion post office building program. What the Administration proposes here is an expansion and speed-up of the present lease-purchase program that has about 150 buildings in the works. Investors and builders already are showing interest in the more liberal terms of this new program.

The Administration now plans to build or replace over the next three to five years some 14,500 government-owned or leased post offices throughout the country. This would be financed by $1.5 billion from private investors and $175 million from the government.

Schools and Highways

Some officials are talking up two additional types of construction spending as anti-recession weapons—the federal school construction program that Pres. Eisenhower proposed a couple of years ago and an accelerated interstate highway construction program.

continued on next page

Sen. Case (R., N.J.) is a leader of those who think expanded federal construction spending should include schools. And Administration officials are studying proposed highway legislation that would permit interstate highway construction contracts to be let even when the highway trust fund, built up by tax receipts, is fully committed.

There's talk of permitting the trust fund to issue bonds of its own as a way of accelerating highway construction. But some officials favor just paying the bills for expanded construction out of the Treasury and letting the budget run that much in the red.

A Good Start

While some other segments of the economy are showing a decline, construction is holding up well, according to official figures for the first month of this year. Overall outlays for construction during January totalled $3.3 billion—up $100 million from January, 1957.

Expenditures for heavy engineered construction projects ran $109 million ahead of a year ago, hitting $743 million for the month. Residential construction stood at $1.1 billion—same as a year ago.

Government economists expect the upswing in building activity to continue during the next several months. But the unusually severe weather conditions during February may play hob with the first quarter results in some areas.

Total construction for January was running at an annual rate of $48.5 billion, $1.3 billion more than actual level of 1957. And experts are sticking by their forecast that overall construction for this year will be about $2.4 billion more than last year.

Building Trades Make Peace

AFL-CIO construction unions are waving the olive branch—both to other unions and to employers. They are out to solve their jurisdictional fights with rival industrial unions. And they are indicating a willingness to do away with featherbedding and other practices that have boosted building costs.

In a deal with the industrial unions, the AFL-CIO Building Trades are now trying to operate under a peace formula that will divide construction jobs in industrial plants. To the craft unions go new construction. The industrial unions get all maintenance and production work. Disputes in the still unassigned middle territory will be settled by two-man teams from each side at the plant where the dispute occurs. It won't end all jurisdictional disputes at once; but it's a start.

For the first time, Building Trades officials spelled out a list of practices they agreed are adding extra, and unnecessary, costs to building. In an agreement with the National Constructors Association, the craft unions pledged to try and eliminate 10 such practices, including: forcing of overtime, use of standby crews, spread work policies. The contractors who negotiated the agreement think it's a big step ahead. But there's no certainty how well unions will live up to their pledges.

Introducing the New

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Baker

YALE

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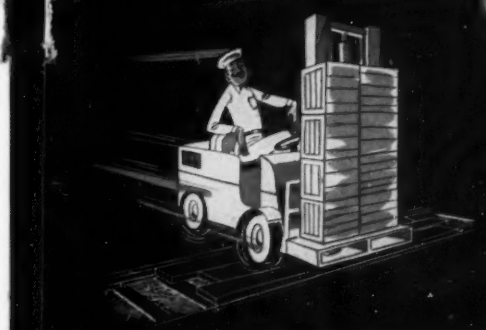

PROVED THE MOST EFFECTIVE SHOCK-ABSORBER FOR LIFT TRUCKS AND BUCKET LOADERS!

Be sure your vehicles are equipped with the new low-cost GREEROLATOR!

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SMOOTHER, FASTER OPERATION!

VEHICLE EFFICIENCY INCREASED!

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Successfully Demonstrated to Leading Vehicle Manufacturers

In test after test, the GREEROLATOR proved its tremendous ability to absorb shock and vibration under the most rugged operating conditions. In each test, fully loaded lift trucks and bucket loaders maneuvered over the roughest ground at top-speed. The characteristic bounce and jounce set up by the moving load was visibly reduced to a **slight floating action.** You could actually **see** and **feel** the difference!

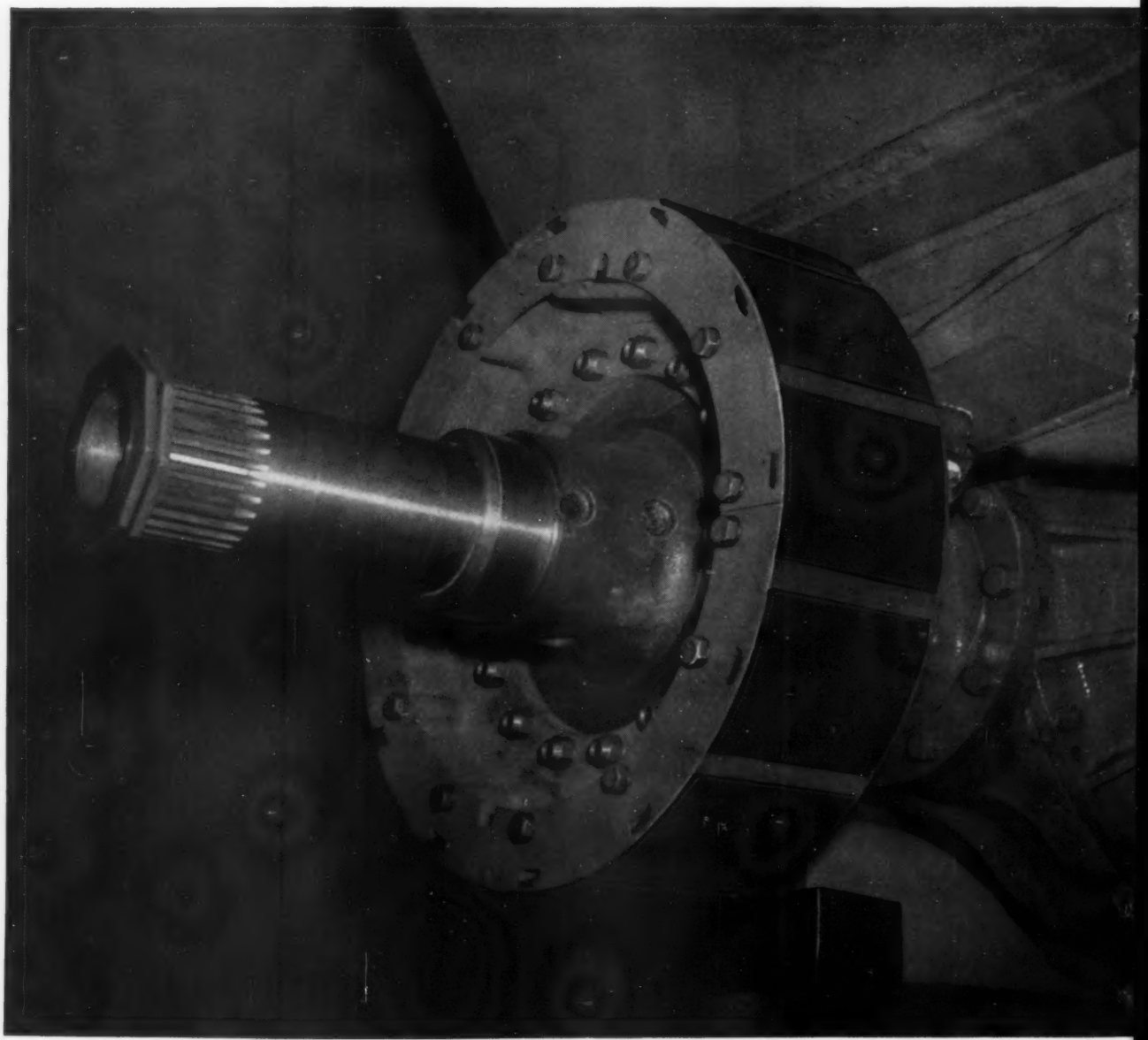
By reducing shock to cylinders, hose, packings and other major parts, the GREEROLATOR sharply cuts replacements and maintenance costs! Heavier and larger loads can now be carried faster . . . **and more safely!** Drivers, free from the tiring effects of vibrations, work better! In every way, a low cost GREEROLATOR installed on your equipment usually means increased production with greater profits for you on every job.

ASK YOUR DEALER FOR A DEMONSTRATION!

OR WRITE GREER HYDRAULICS INC. • NEW YORK INTERNATIONAL AIRPORT • JAMAICA 30, NEW YORK

New B. F. Goodrich Hi-Torque Brake

THE FIRST AND ONLY WITH FULL-CIRCLE



B.F.Goodrich

OFF-ROAD BRAKE STOPPING POWER

For years B.F.Goodrich wheels and brakes have been landing big commercial and military aircraft. Now, adapting successful engineering design to the heavy duty equipment field, B.F.Goodrich has developed an off-road brake that outperforms other brakes in every case.

It's the B.F.Goodrich Hi-Torque Brake, the *only* off-road brake with reserve capacity to handle the needs of larger and larger equipment. Unlike conventional anchored-shoe brakes that are actuated at only two points, the B.F.Goodrich Hi-Torque Brake actuates with uniform hydraulic pressure under each of *12* shoes.

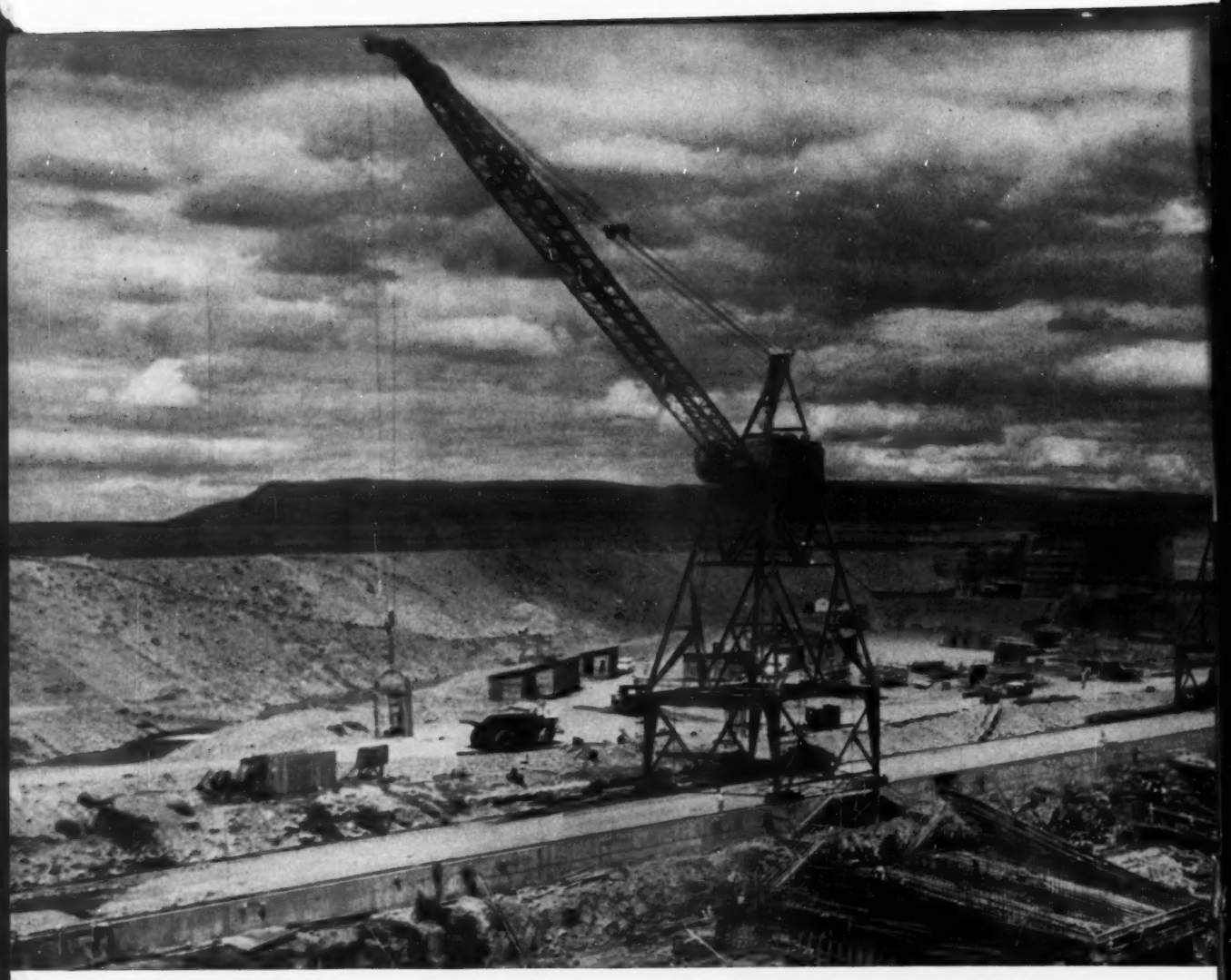
On-job tests prove that the B.F.Goodrich Hi-Torque stops mammoth equipment up to two and a half times faster than ordinary two-shoe brakes. Operators can reduce cycle time by maintaining higher speeds with safety. In addition, automatic adjustment is provided throughout the life of the linings. Full circle actuation allows shoes to follow drum eccentricities. This equalizes lining pressure—makes braking action smoother—reduces fade. And torque is equal in forward or reverse.

If you build or use trucks, tractors, scrapers or any wheeled off-road vehicles, you'll want to know more about this revolutionary new B.F.Goodrich Hi-Torque brake. It installs quickly, easily—requires only a single hydraulic connection. No lubrication necessary.

Free descriptive folder—The B.F.Goodrich Hi-Torque Brake—gives actual on-job test results and specifications of typical sizes up to 26" x 7" with torque capacities exceeding 120,000 pound-feet. Write: B.F.Goodrich Aviation Products, a division of The B.F.Goodrich Company, Troy, Ohio.

The B.F.Goodrich Hi-Torque Brake is now standard equipment on the M-R-S 250 Scraper (left) and 550 horsepower M-R-S 250 Tractor, the world's largest rubber tired scraper combination with a capacity of 34 cu. yds. struck and 43.5 cu. yds. heaped. Designed for use with straight hydraulic or air-over-hydraulic systems, the B.F.Goodrich Hi-Torque Brake is already available on other off-road equipment.

B.F.Goodrich Hi-Torque brakes



Up-to-date, streamlined lubrication method pays significant dividends in maintenance savings

Texaco Simplified Lubrication Plan

Plan can reduce lubricant inventory and improve lubrication. It can mean more productive man-hours, less repair costs, less time lost

If you are using more than six lubricants for your major lubricating jobs, chances are your maintenance costs are a lot higher than they should be. Storage problems, handling costs, and the dangers of mis-application are often costly results of stocking more lubricants than you need.

Texaco Plan cuts number of lubricants needed

Specifically tailored to your operation by your local Texaco Lubrication Engineer, this new plan can cut your requirements to not more than six lubricants for *all* your major lubrication needs. Yet the

(Advertisement)

The Texaco Simplified Lubrication Plan is saving maintenance dollars on this big power house project. This impressive excavation is over 4,000 feet long and between 40 and 90 feet deep.

Plan is simple to put into action; it works smoothly; and above all, it will save you a significant amount of money.

How the Texaco Plan works

The Texaco Simplified Lubrication Plan is based on a proven combination of multi-purpose lubricants—varied to meet the particular requirements of your job. Your Texaco Lubrication Engineer will work with you, going over all your lubrication needs to see that your operation gets the *best* in modern lubrication with the *minimum* number of lubricants.

Get the complete story

Your nearest Texaco Lubrication Engineer can give you complete information on the Simplified Lubrication Plan. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States; or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

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LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

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Job Talk...

C-Hook Speeds Pipe Laying

A steel industry tool can save time in laying drainage pipe in trenches. The tool is a C-hook that lifts terra cotta or concrete pipe from an embankment, lowers it into the trench, and slips the pipe into the bell of a previously laid pipe section. McCarl's Plumbing and Heating Co. of Beaver Falls, Pa., had the hook specially made by Materials Handling Division of Heppenstall Co., New Brighton, to place drainage pipe in trenches 14 ft deep on a New Brighton, Pa., building job. The hook, cut from a steel plate, has a clevis at the top and a hand grip at the side with a tapered leg that extends 28 in. into the pipe section.

Working with Powder Actuated Tools

Do you use powder actuated tools to place studs, pins, or fasteners? Then here are some suggestions on handling them from the Powder Actuated Tool Manufacturer's Institute:

• Servicing

Test the tool each day before loading to see that safety devices are in proper working condition. Test methods should be in accordance with manufacturer's recommended procedure. Remove any tool found not in proper working order and have it repaired by competent repair men.

• Limitations of Use

Fasteners should not be driven into very hard or brittle materials such as cast iron, glazed tile, surface hardened steel, glass block, live rock, face brick, or hollow tile.

Driving into soft materials should be avoided unless the material is backed by a substance that will prevent the pin or fastener from passing completely through and creating a flying missile hazard on the other side.

Fasteners should not be driven directly into materials such as brick or concrete closer than 3 in. from the unsupported edge or corner, or into steel surfaces closer than ½-in. from the unsupported edge or corner unless a special guard, fixture, or jib is used.

When fastening other material, such as a 2x4 wood section to a concrete surface, drive a fastener of no greater than 7/32-in. shank dia not closer than 2-in. from the unsupported edge or corner of the work surface.

Fasteners should not be driven through existing holes unless a positive guide secures accurate alignment.

No fastening should be attempted into a spalled area caused by an unsatisfactory fastening.

Tools should not be used near fires or explosives.

continued on next page

All tools should be operated with the correct shield or muzzle guard supplied by the manufacturer.

• Tool Handling Safety

Don't let an operator use a tool unless he wears safety goggles or safety glasses of an approved type.

Make certain the operator inspects the tool to see that it is clean, that all moving parts operate freely, and that the barrel is free from obstructions.

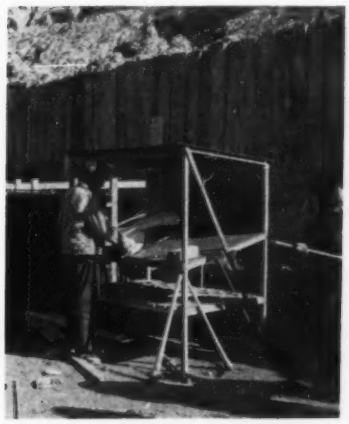
When a tool develops a defect during use, take it out of operation and have it repaired immediately.

Don't load tools until just prior to the intended firing time. Keep hands clear of the open barrel end and never point a loaded or an empty tool at another workman.

Never load a tool unless it is ready to be worked and never leave a loaded tool unguarded.

In case of a misfire, hold the tool in the operating position for at least 15 sec. Then, hold the muzzle against the work surface and dis-assemble or open the tool and remove the powder load.

Never leave a tool unattended in a place where it would be available to unauthorized persons.



Portable Plan Shanty

Scraps of plywood and lumber can be put together to build a portable plan shanty that will provide shade from sun and shelter from rain. And two men easily can move the shanty to any part of the job.

non-slipping power transmission licks tough coral digging

You dig coral rock when you dig in Dade County, Florida. Clevelands have been chewing out trench in these tough rock formations for over 30 years, delivering good steady production on every job. This dependable performance in rugged digging is largely due to Cleveland's time-proved system of economical power transmission to digging-wheel and crawler, through positive, power-saving, non-slipping gear trains. Cleveland's exclusive multi-speed transmission gives the operator finger-tip control of more than 30 usable, closely graduated combinations of digging-wheel and crawler speeds, putting at his command always the *right* combination of digging power and speed for every soil and terrain, for every digging condition.

Send now for Folder V-616 fully describing this valuable Cleveland Trencher advantage.

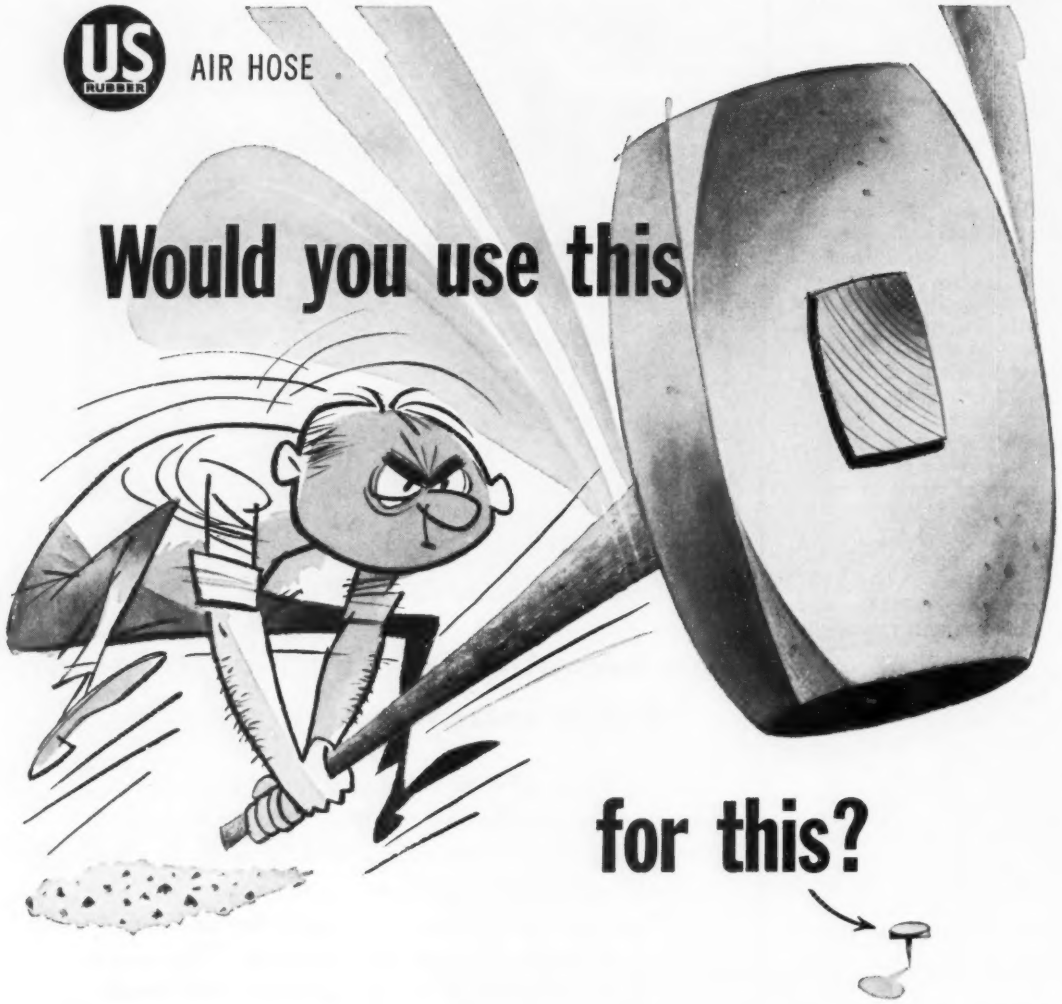
The CLEVELAND TRENCHER Co.

20100 St. Clair Ave.
Cleveland 17, Ohio

Good Everywhere

US RUBBER AIR HOSE

Would you use this



for this?

Then why pay extra for heavyweight, muscle-bound air hose, when U. S. Rubber Air Hose is easier to handle, more flexible, and withstands higher working pressures... at lower end cost.

When you're on a tight budget and a tight schedule, there's no sense in throwing dollars away buying overweight, hard-to-handle air hose. Such hose—with excessive, unnecessary plies—is out of date, will slow you down, and leave you out of pocket.

Now, thanks to "U. S." engineering, you get the optimum balance in air hose—easier to handle *and* at the same time tougher and less expensive. What's more, U.S. Air Hose handles higher working pressures than the conventional air hose you might be using.

Every hose in the complete "U. S." line is designed to give maximum service, even under unreasonable demands. Take advantage of the skill and long experience of "U. S." Hose technicians, plus "U. S." research and production facilities. Get U. S. Air Hose at your local authorized "U. S." Hose Distributor, or write us at Rockefeller Center, New York 20, New York. In Canada: Dominion Rubber Co., Ltd.

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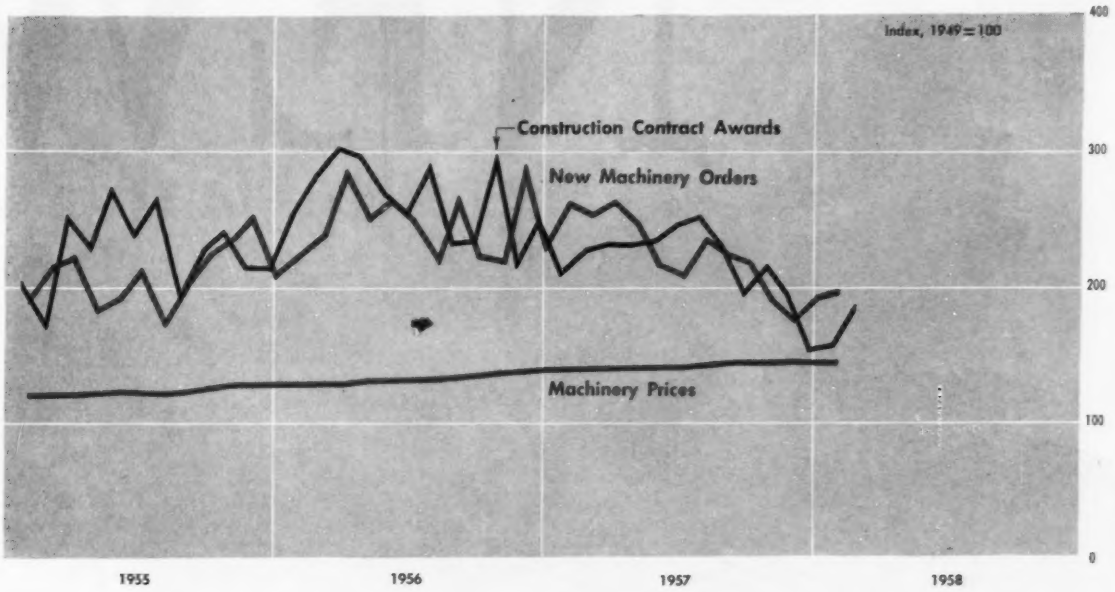
See things you never saw before. Visit U. S. Rubber's New Exhibit Hall, Rockefeller Center, N.Y.

Trends in the Machinery Market



Price Index

	JAN 1958	MONTH AGO	YEAR AGO	PERCENT 1957-1958 CHANGE
All Types of Equipment	165.4	165.3*	156.2	+ 5.9
Cranes, Draglines, Shovels	**163.0**	**163.0**	**157.2**	**+ 3.7**
Shovel, ½ cu yd	153.7	153.7	149.0	+ 3.2
Shovel, ¾ cu yd	167.4	167.4	158.9	+ 5.3
Shovel, 1-1½ cu yd	174.3	174.3	165.8	+ 5.1
Shovel, 2 cu yd	154.4	154.4	139.2	+10.9
Shovel, 3-3½ cu yd	162.7	162.7	154.1	+ 5.6
Shovel, 6 cu yd	179.5	179.5	170.9	+ 5.0
Bucket, dragline	135.1	135.1	124.0	+ 9.0
Crane, tractor mounted	164.2	164.2	161.0	+ 2.0
Crane, truck mounted	152.7	152.7	152.7	0
Bucket, clam shell	180.8	180.8	180.8	0
Scrapers and Graders	**158.8**	**158.8**	**148.9**	**+ 6.6**
Scraper, 4 Wheel, 8-8.4 cu yd	155.0	155.0	145.2	+ 6.7
Scraper, 4 Wheel, 14.4-15.2 cu yd	151.3	151.3	140.6	+ 7.6
Scraper, 2 Wheel (a)	122.7	122.7	113.6	+ 8.0
Grader, heavy duty	164.0	164.0	154.1	+ 6.4
Grader, light & medium	161.2	161.2	152.2	+ 5.9
Tractors	**180.8**	**180.0**	**168.7**	**+ 7.2**
Wheel-type, off-highway (a)	127.7	127.7	118.6	+ 7.7
Crawler type, 37.0-45.1 dph	182.6	182.6	171.9	+ 6.2
60.5-75.0 dph	185.8	185.8	174.8	+ 6.3
102.0-116.0 dph	186.7	186.7	172.3	+ 8.4
126.0-155.0 dph	191.8	191.8	178.0	+ 7.8
Machinery, Tractor Mounted	**161.7**	**161.7**	**154.3**	**+ 4.8**
Dozer, cable control	151.6	151.6	149.0	+ 1.7
Dozer, hydraulic control	177.3	177.3	169.8	+ 4.4
Cable, power control unit	147.9	147.9	136.6	+ 8.3
Loader, shovel type	153.9	153.9	146.5	+ 5.1
Specialized Machinery	**150.2**	**149.4***	**141.3**	**+ 6.3**
Ditcher	154.1	154.1	147.1	+ 4.8
Roller, tandem	193.2	193.2	172.8	+11.8
Roller, 3 wheels	161.6	161.6	148.6	+ 8.7
Ripper and rooter	143.3	143.3	132.8	+ 7.9
Dewatering pump, 10 M gph	111.7	110.9*	108.1	+ 3.3
Dewatering pump, 90 M gph	142.4	135.6	133.3	+ 6.8
Portable Air Compressors	**159.1**	**159.1**	**146.2**	**+ 8.8**
Contractors Air Tools	**164.3**	**164.3**	**150.0**	**+ 9.5**
Mixers, Pavers, Spreaders	**148.8**	**146.3***	**140.7**	**+ 5.6**
Mixer, portable, 6 cu ft	151.5	149.5*	141.8	+ 6.8
Mixer, portable, 11 cu ft	160.1	157.3*	150.5	+ 6.4
Mixer, portable, 16 cu ft	162.7	161.6	151.4	+ 7.5
Mixer, truck, 4½ cu ft	125.7	124.1*	120.1	+ 4.7
Mixer, paving, 34 cu ft	185.2	177.2*	166.8	+11.0
Concrete finisher	173.0	173.0	166.3	+ 4.0
Bituminous distributor	122.4	115.9	115.9	+ 5.6
Bituminous spreader	160.3	160.3	149.9	+ 6.9
Bituminous paver	153.0	153.0	149.8	+ 2.1

a Index based on January, 1955 = 100 * Revised
BLS Primary Market Price Indexes, U.S. Department of Labor, 1947-49 = 100

No Price Changes On Most Machines

Construction machinery prices generally held steady in January except for scattered increases. For the second consecutive month, there was practically no change in the over-all price index reported by the U.S. Bureau of Labor Statistics. On January 15 it stood at 165.4, based on 1947-49 prices as 100.

Prices of concrete mixing and paving machinery, pumps, and bituminous distributors moved higher between December 15 and January 15. Bituminous spreaders rose the most, 5.6%. Other big hikes came in 90 M gph pumps, up 5%, and 34 yd paving mixers, up 4.5%.

During the 12 months ending in January, manufacturers' prices have increased an average 5.9% as measured by the BLS indexes. But most sizes of shovels and cranes moved up by smaller amounts. By contrast, larger than average increases were tacked on prices of tractors and most sizes of scrapers and graders—up 6% to 8%. Compressors and air tool prices are up 7% to 10% over a year ago.

Contracts Turn Upward

Heavy construction contracts rose for the second month in a row during February when the Awards Index reached 187 (1949=100). This was the fourth best February on record and the highest for the month since 1955.

Though contracts in the first two months of '58 have slipped 21% under the corresponding 1957 total, Construction Methods looks for awards during the next three or four months to come closer to the year-ago rate.

Contractors increased orders for new machines in December and again, slightly, in January.

NEW

Ruggedness, power, operator's comfort, and all-around economy are featured in the new "440" Crawler.

WORTHY "STABLEMATE" of the POPULAR "420"

Every inch another "thoroughbred," the new John Deere "440" is a worthy "stablemate" of the ever popular John Deere "420," the busy, capable, and economical crawler that continues to merit the praises of efficiency-minded industrial users everywhere.

With a capacity for work that must be seen to be believed, combined with a nimbleness that cuts maneuvering time drastically, these tractors have the ability to squeeze more work out of every piece of equipment and to press more work into every hour.

New Heavy-Duty Track Assembly—Simple Adjustment

New strength . . . new durability . . . in power train and in 5-roller track assembly assure outstanding traction and greater lugging capacity. Wide choice of track shoe sizes, including a new 12-inch all-purpose shoe, assures traction aplenty on any type or combination types of industrial jobs. Clutch-brake steering assures "turn-on-a-dime" maneuverability.

Lounge-Chair Comfort for the Operator—Convenient Controls

New comfort and protection for the operator . . . new eye-centered controls and gauges . . . new easy view of work being done—all are here in full measure. Result—an easy-handling smooth-working unit that means more productive hours on the job, less operator fatigue.

New, Heavy Buffer-Type Front End

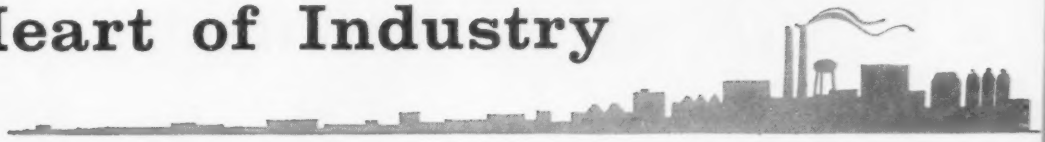
The strictly industrial design of the "440" is most evident in the husky front end—an immediate outward indication of the tractor's solid brawny strength throughout. No grille guard is required. Room is provided for front crankshaft-driven pumps.

New, Clutch-Type Direction Reverser (Optional)

The new clutch-type direction reverser is simple, easy to use, and effective. A touch of the handy lever and the tractor travels forward or backward at the same speed. It is not necessary to shift gears.

Advertisement

. . and Sure to Win Their Way to the Heart of Industry



JOHN DEERE "440" Industrial TRACTORS

Here they are . . . trim and eager . . . and literally "born" to save you money, whatever business you're in—the New John Deere Industrial Tractors.

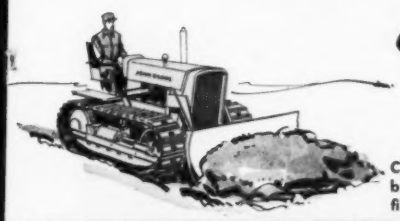
"Born" to save you money?

We could hardly put it better. For these are INDUSTRIAL tractors from top to bottom . . . ruggedly built from grille to drawbar . . . and designed, inside and out, to fill definite needs in industrial work of all types . . . to cut to rock bottom the costs of such jobs as earth moving, materials handling, sand and gravel work, maintenance, and many other—often specialized—jobs in contracting, construction, utilities, manufacturing, and public works.

Both, the John Deere Crawler and the John Deere Wheel-Type, are built around an amazingly efficient, precision-tooled John Deere engine, unmatched for delivering so much, for so long, for so little cost. Both have many construction features of hood, grille, frame, and either wheel or track assemblies that enable them to do more than their share of the day's work of pushing, pulling, lifting, digging, and hauling. Their clean, modern, functional design throughout makes them businesslike in operation, easy to service, and economical to maintain. A line of proved, matched working equipment gives them the versatility that industry demands.

Size up these modern tractors in the light of your requirements. It may be the start of making your power dollars go farther than you thought possible.

Completely Engineered for Industry



The John Deere Crawler is ideal for bulldozing and backfilling.

It's the highly mobile new "440" for use by contractors of all kinds, public utilities, states, counties, municipalities, manufacturing concerns, and many others.

Many optional features, including built-in power steering, add to the versatility of the Wheel-Type.

These tractors make loading and materials-handling fast, easy jobs.

You can team up your "440" Industrial Tractor with any of the long line of matched and tested working equipment.

Efficient, low-cost digging and excavating are assured.

JOHN DEERE Industrial Tractors and Equipment

For Further Information Write:

JOHN DEERE INDUSTRIAL DIVISION • Moline, Illinois

Gardner-Denver "Air Trac" drills and portable compressors quarrying fill for the Courtright Dam.

Two Gardner-Denver "Air Tracs" drill out rock at the Wishon Dam site.

This monitor is washing down loose rock at the Courtright Dam site. It is supplied with water by a diesel-driven Gardner-Denver 8-in. centrifugal pump.

This is one of the Gardner-Denver 600 rotary compressors supplying air to "Air Trac" drills on the Courtright Dam project.

Here's equipment fit for Kings

The project

Pacific Gas and Electric Company's Kings River hydroelectric project. Its purpose is to supply an extra 261,500 kw. of electricity to California's industrial, farm and domestic consumers. The job includes: (1) constructing the Courtright and Wishon dams, (2) enlarging the existing Balch diversion dam, (3) driving ten miles of new tunnels, and constructing 2000 feet of tunnel siphon pipe, (4) installing two miles of penstock, (5) building the Haas and Kings River powerhouses, (6) enlarging the existing powerhouse.

Gardner-Denver equipment on the job

Contractors working throughout this mammoth project rely on the following Gardner-Denver equipment:

- 3 RP900 rotary portable compressors
- 6 RP600 rotary portable compressors
- 14 WBJ compressors
- 18 "Air Trac"® units with DH123 drills
- 1 HT 143 drill unit
- 18 SF93 drifters
- 9 RB93 stopers
- 30 S55D sinkers
- 4 VP4 sump pumps
- 8 8" centrifugal pumps

1100-ft. long diversion tunnel for Courtright Dam. This was driven with two Gardner-Denver SF93 drifters and one DH123 drill mounted on an aluminum guide.

ENGINEERING FORESIGHT—PROVED ON THE JOB
IN GENERAL INDUSTRY, CONSTRUCTION, PETROLEUM AND MINING

GARDNER - DENVER

Gardner-Denver Company, Quincy, Illinois
In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Avenue, Toronto 16, Ontario

CATERPILLAR REPORTS ON THE ILLINOIS TOLL HIGHWAY

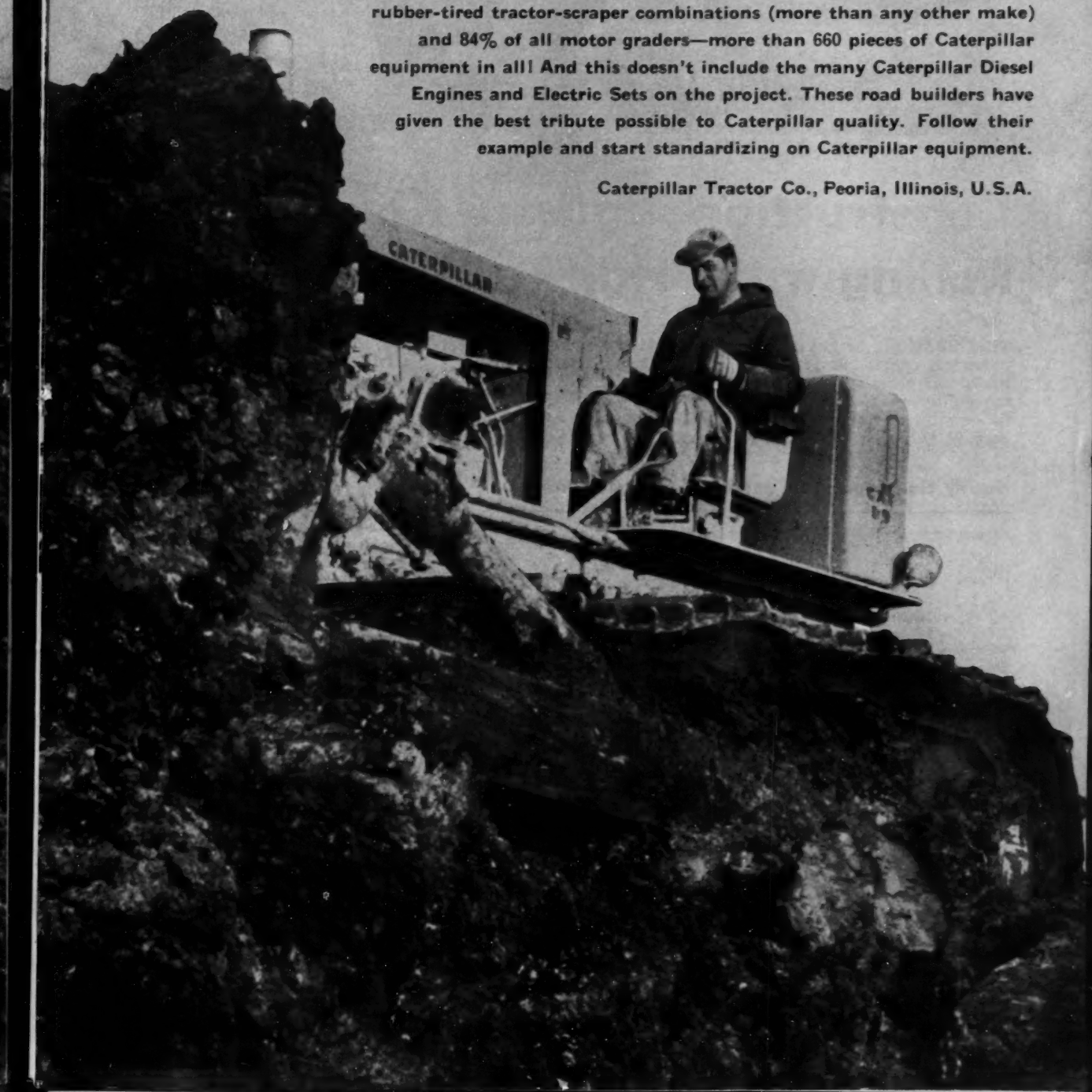
Caterpillar is first choice

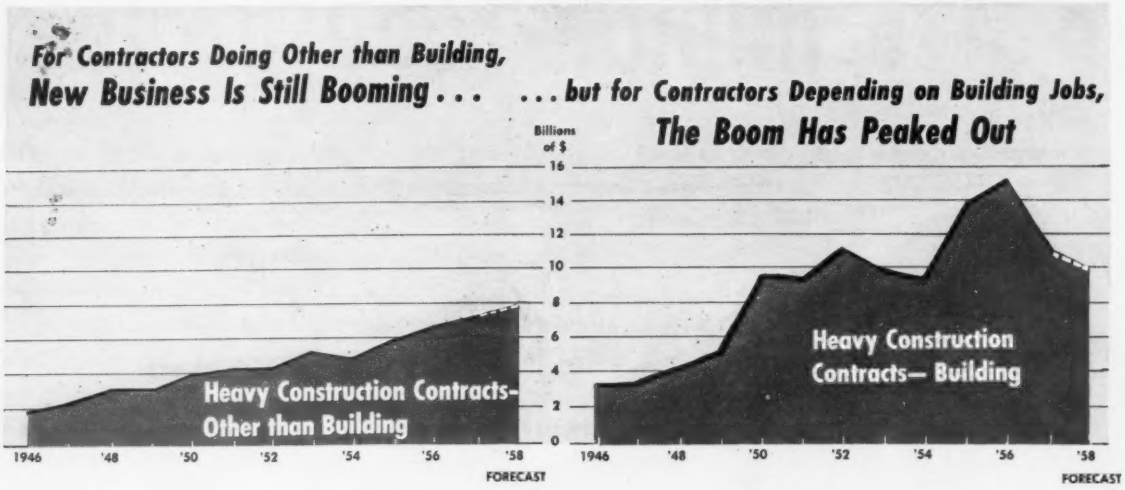
Massive Caterpillar D9 Tractor, owned by Western Contracting Corporation, digs in on the Illinois Toll Highway.

on $415 million road project

More Caterpillar-built equipment is at work on the Illinois Toll Highway than all similar machines of competitive make put together. Contractors agree, and have picked Caterpillar machines for this $415 million project. At production's peak last fall, the score was: 53% of all machines—68% of all track-type tractors, 39% of all rubber-tired tractor-scraper combinations (more than any other make) and 84% of all motor graders—more than 660 pieces of Caterpillar equipment in all! And this doesn't include the many Caterpillar Diesel Engines and Electric Sets on the project. These road builders have given the best tribute possible to Caterpillar quality. Follow their example and start standardizing on Caterpillar equipment.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.





Construction Industry Keeps Rolling with "Half" a Boom

THIS YEAR will be just as good a business year as last year. But it also will probably be the most competitive year of last decade for construction contractors. Reports of numerous bidders, very close bidding, and contract prices well below engineering estimates are coming in from several sections of the country.

The reason for this intense competition for new work is that available new construction contracts reached a peak early in 1956 and has been falling off since then. Although the volume of new business is still high the value of contracts awarded is much less than it was at the peak two years ago.

Will the downtrend in new business continue? Construction Methods sees signs that the downtrend in awards bottomed out in December, 1957. Since then contracts have increased in volume for two consecutive months. Volume so far this year is about 80% of what it was during January-February of last year, but the gap will narrow in the months ahead as state and municipal construction moves into high gear and private work levels off.

The large amount of work in the planning stage — some of which was delayed by the tight money conditions of 1956 and 1957—and the flow of new projects into the planning stage indicate that this year's contract volume will come close to last year's. Construction Methods forecasts total heavy construction contracts this year at $17,625 million, 2% under 1957 but the fourth highest year on record.

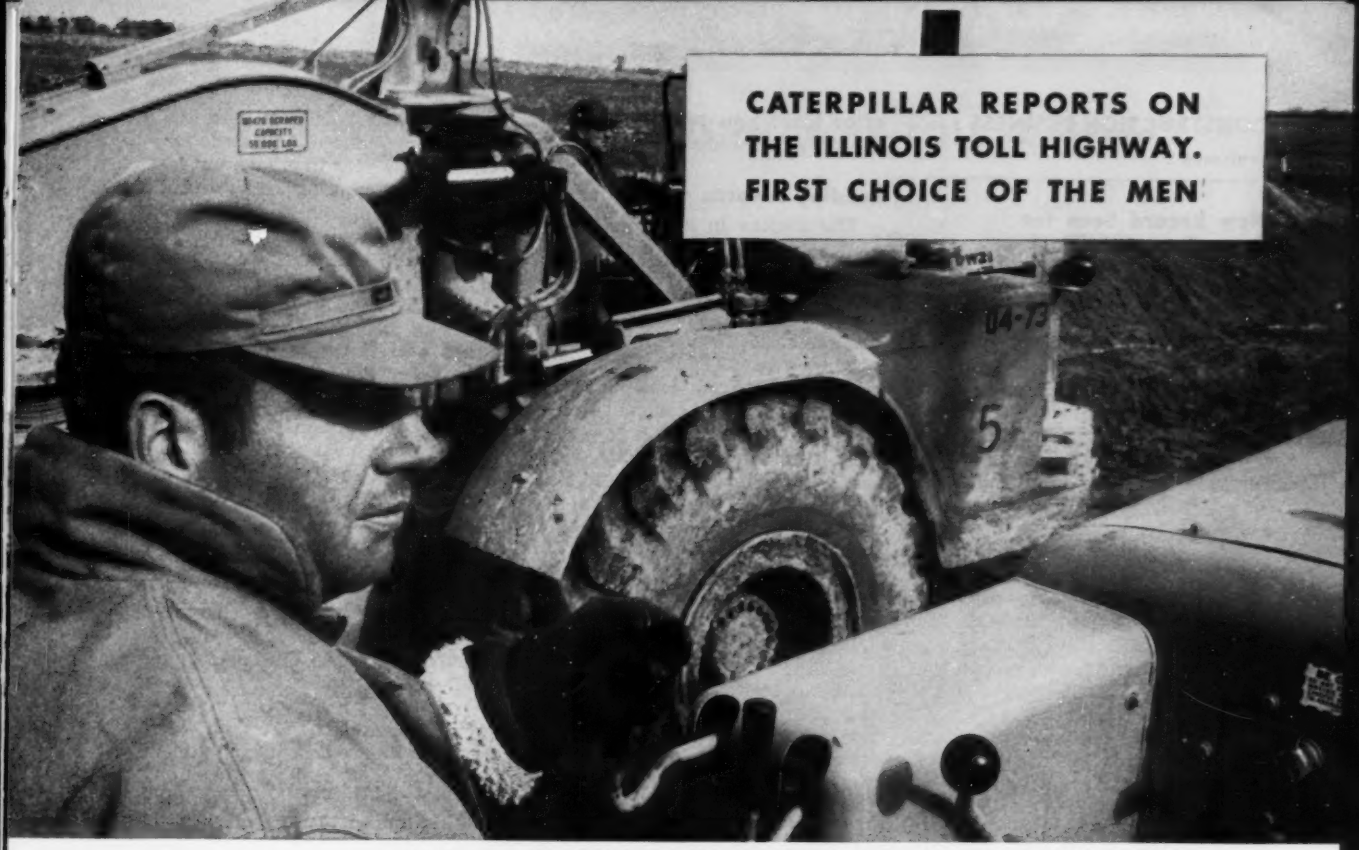
continued on page 28

Heavy Construction Contract Forecast: 1958

As reported by Construction Methods & Equipment in millions of dollars

	1957 Actual	Per Cent Change 1956-57	1958 Forecast	Per Cent Change 1957-58
All Heavy Construction	$17,986	- 17	$17,625	- 2
Other than Building	7,115	+ 8	7,775	+ 9
Waterworks	369	+ 4	425	+15
Sewerage	556	- 4	625	+12
Bridges‡	781	+ 26	760	- 3
Highways	2,965	+ 20	3,500	+18
Earthwork, Dams, Waterways	969	+ 33	975	+ 1
Unclassified, public*	975	- 7	900	- 8
Unclassified, private**	500	- 36	590	+18
Buildings	10,871	- 28	9,850	- 9
Public-Nonresidential	2,353	+ 12	2,400	+ 2
Housing	642	+102	550	-14
Private-Industrial	3,081	- 42	2,700	-12
Commercial	1,754	- 14	1,600	- 9
Mass Housing	3,041	- 43	2,600	-15
By Ownership—				
Public	9,600	+ 17	10,125	+ 5
State and Municipal	7,415	+ 14	8,175	+10
Federal	2,185	+ 29	1,950	-11
Private	8,386	- 38	7,500	-11

*Includes airports, military bases and tunnels
**Includes pipelines, transmission and distribution lines, and hydroelectric
‡Includes private bridges: $9 mil. in '57; $10 mil. in '58



CATERPILLAR REPORTS ON THE ILLINOIS TOLL HIGHWAY. FIRST CHOICE OF THE MEN

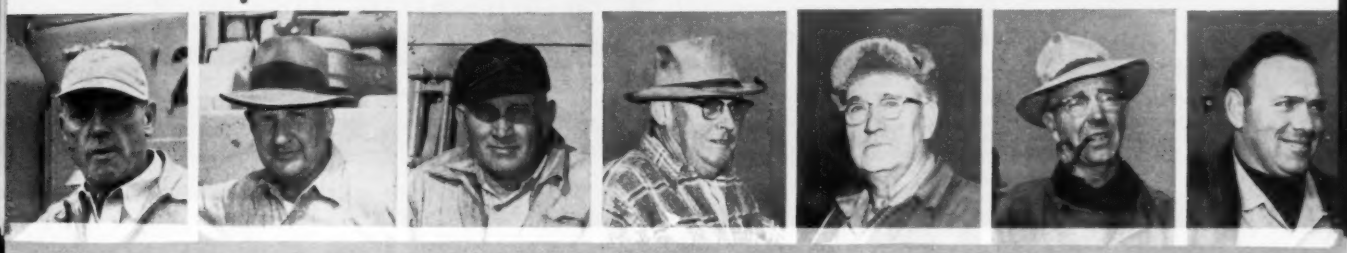
D9 (foreground) and DW21-No. 470 at work for S. J. Groves & Sons Co. on the Illinois Toll Highway.

Contractors agree:

1 *"We looked at them all—then bought Caterpillar."* **2** *"Our DW15s have worked three seasons with no down time."* **3** *"...best service of any earth-movers we've ever had."* **4** *"D9s are powerhouses, maneuverable even in the rough stuff."* **5** *"Been around Caterpillar equipment for some 32 years—and I really like it."* **6** *"We like the capacity of the LOWBOWLS—they'll go on through."* **7** *"Our No. 12s do a good job of maintaining the hauls."*

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

1 Harold Thompson, Central Engineering Co. **2** Emil Strunk, Strunk Bros. **3** Al Ensminger, Orr Construction Co. **4** Glen Roberts of McCarthy, Mass, Dillon **5** Ted Sliger, CKG Associates **6** L. E. Myers, Arcole-Midwest Corp. **7** Claire Hawn, Western Contracting Corporation



CONSTRUCTION BUSINESS . . .

continued

New Record Seen for Some Types of Work

The strength of this year's business trend will come from heavy construction other than building. Awards for waterworks, sewerage, highways, bridges, dams, waterways, pipelines, tunnels and the like are forecast to reach a record $7,775 million. This would be 9% more than in 1957's previous all-time high and 18% more than in 1956.

New records are forecast for highways, up 18%, waterworks, up 15%, sewerage, up 12%, and earthwork-dams-waterways, up 1% over their 1957 totals.

The amount of heavy construction other than buildings will increase this year, but competition for the work will be keen. This is not only because contractors active in these types of work have increased their capacity for taking on new work; it's also because there'll be less new building work coming along. Contractors who have the experience will be out after these jobs to make up for the drop in building contracts.

Building Awards to Decline

The decline in heavy building contracts is in its second year. However, the rate of the fall-off is going to diminish this year, according to the Construction Methods forecast. Total contracts are predicted at $9,850 million this year, off 9% from last year and 37% under 1956's colossal buildings total.

Lower awards for private projects—mass housing, commercial building, and industrial plants—account for the decrease expected in total building work. But partially offsetting the drop in private projects will be another big year for public buildings—public buildings awards are forecast to rise 2%.

While the outlook for private building awards is not bright, it could change—and rapidly. Private contracts have proved many times in the past 10 years that they can reverse a trend in a short period of time. The volume of proposed private projects entering the planning stage during the past 12 months has indicated a lower volume of construction awards this year than last, but an upturn in planning could bring about a change in the trend of awards within a few months. However, a substantial recovery in private work is not expected this year.

State and Local Work Heads for Biggest Year

The outlook for state and municipal construction contracts in 1958 is very bright. Construction Methods forecasts awards for heavy public works construction will rise 10% this year to a new record of $8,125 million. This will come on top of 1957's 14% increase.

Though there have been scattered reports that a few states and cities were reconsidering their 1958 construction programs in the light of rising unemployment, possible declines in tax revenues, and consequent budget squeezes, a special Construction Methods survey at the beginning of this month reveals there will be no "recession" in public works.

continued on page 32

ALWAYS, More and Better Compaction with

BMCO'S SELF-PROPELLED ROLLER

MODEL SPR-9

4 SPEEDS FORWARD — 4 SPEEDS REVERSE
The finest "self-propelled" pneumatic tired roller . . . ANYWHERE! The largest power unit of any roller in its class . . . larger displacement . . . more horsepower with a torque converter as standard equipment. The SPR-9 is rugged . . . durable . . . dependable, and only BMCO has complete oscillation on all wheels! IT IS IMPOSSIBLE TO OVER-LOAD ANY ONE TIRE! All wheels act independently in this exclusive design . . . each bearing its share of the load. As a result, better traction and more uniform compaction is attained, more quickly than by any other make of roller!

MODEL SPR-9B

The same specifications as the SPR-9, except: a smaller power unit and heavy duty industrial type clutch . . . however, this power unit is still more powerful than all others in its class . . . same 4 forward speeds . . . same everything as in the "deluxe" model, but approximately $1,000 less.

OTHER QUALITY ITEMS IN THE BMCO LINE:

PNEUMATIC ROLLERS · ROCKBUSTER · 50 TON COMPACTORS · SHEEPSFOOT ROLLERS · VIBRATING ROLLERS

BMCO

BROWNING MANUFACTURING CO.

111 HUMBLE AVENUE P. O. BOX 2707
SAN ANTONIO 6, TEXAS

BMCO AND ROCKBUSTER ARE COPYRIGHTED TRADEMARKS OF THE BROWNING MANUFACTURING CO.

CATERPILLAR REPORTS ON THE ILLINOIS TOLL HIGHWAY

First choice by count

	CAT %	NEXT HIGHEST %	TOTAL MACHINES*
All machines	53	18	1,239
Track-type tractors	68	21	499
Wheel tractors-scrapers	39	30	426
Motor graders	84	6	140

*Based on tally of machines as of October 1, 1957

DW21, owned by McCarthy, Mass, Dillon, is pushloaded by a D9 on a section of the Illinois Toll Highway near Elgin. LOWBOWL design, fast cycle time make DW21-No. 470 rig a favorite on this project.

Caterpillar manufactures a full line of earthmoving equipment—track-type tractors, wheel-type tractors, scrapers, motor graders, Traxcavators.

Each machine is scientifically designed to perform its function profitably and dependably, 24 hours a day, *every day*. Each machine is manufactured from the finest materials under the most exacting conditions to meet standards of quality that are the best in the industry. Each machine is exhaustively tested under a variety of demanding conditions, perfected before being placed on the market. Each machine is backed by a world-wide dealer organization ready to give matchless service. Each machine has the safeguard of a complete line of genuine parts, built to the same rigid specifications as the machine itself, and always available instantly at your dealer.

There is a good way to find out what Caterpillar quality and performance can mean to you. Let your Caterpillar Dealer demonstrate the equipment that's best for your job—*on your job.*

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR

Caterpillar, Cat and Traxcavator are Registered Trademarks of Caterpillar Tractor Co.

WORLD'S NO. 1 ROAD BUILDER

D6, owned by Central Engineering Co., 'dozes in muddy conditions on section of Illinois Toll Highway near Aurora.

DW20, owned by CKG Associates, is pushloaded by one of more than 50 D9s at work on the 187-mile road.

D8—No. 463 combination, owned by Arcole-Midwest Corp., needs its surefootedness in and out of swamp area.

No. 12, owned by S. J. Groves & Sons Co., grades an embankment. Earthmoving phase of road is near completion.

Are you sure you're blasting on the most profitable

KNOW YOUR

FREE,

basis?

BLASTING COSTS!

simplified computing method—developed by Atlas —quickly gives you true, complete cost picture

Explosives costs alone don't always determine the value of blasting. The explosives you use have a direct effect on cost of drilling, digging, hauling and crushing. When you have all the cost figures at hand, you can eliminate guesswork—plug profit leaks wherever they occur, and wind up money ahead!

Atlas can show you how, with this new Blasting Cost Chart. It's simple to use—involves no extra bookkeeping. But what a difference it makes in knowing your true profits and how to protect or improve them!

The Atlas Blasting Cost Chart is yours without cost. Ask the Atlas representative nearest you for full details now!

EXPLOSIVES DIVISION
ATLAS POWDER COMPANY
WILMINGTON 99, DELAWARE
offices in principal cities

CONSTRUCTION BUSINESS . . .

continued from page 28

Of 27 cities reporting, 21 rated their 1958 contract letting prospects as "good" to "excellent."

Moreover, in nearly all cities covered, municipal construction programs are going ahead on schedule. Three areas are definitely stepping up their construction programs: Chicago, Harrisburg, Pa., and the Knoxville-Oak ridge, Tenn., area. The last two of these three areas are examples of a new trend that is showing up—they are speeding up construction programs to counteract rising unemployment. In some state capitols, this thinking is also evident. Governors of Connecticut, New Jersey, New York, and Pennsylvania are moving to enlarge state construction budgets for 1958; others may follow suit.

Particularly bright municipal construction prospects are reported in these areas: New Haven, Conn.; Trenton, N.J.; Norfolk, Va.; Birmingham, Ala.; Miami, Fla.; Omaha, Neb.; Billings, Mont.; San Francisco, Calif.; and Portland, Ore.

Prospects are reported "good" in: Buffalo, N.Y.; Atlanta, Ga.; Nashville, Tenn.; Milwaukee, Wis.; Jefferson City, Mo.; Topeka, Kan.; Austin, Tex.; Ft. Worth, Tex.; Boise, Idaho; and Sacramento, Calif.

Correction: '57 Contracts

The 1957 contract totals (February '58, page 44) for Arizona, Nevada and Utah are revised to, respectively: $195,461,000; $54,093,000; and $104,301,000. Per cent changes 1956-57 become: Arizona +7%; Nevada + 95%; and Utah +14%.

This puts all of the $108 million Glen Canyon Dam, Arizona, contract into that state. The award was originally divided among the 3 states.

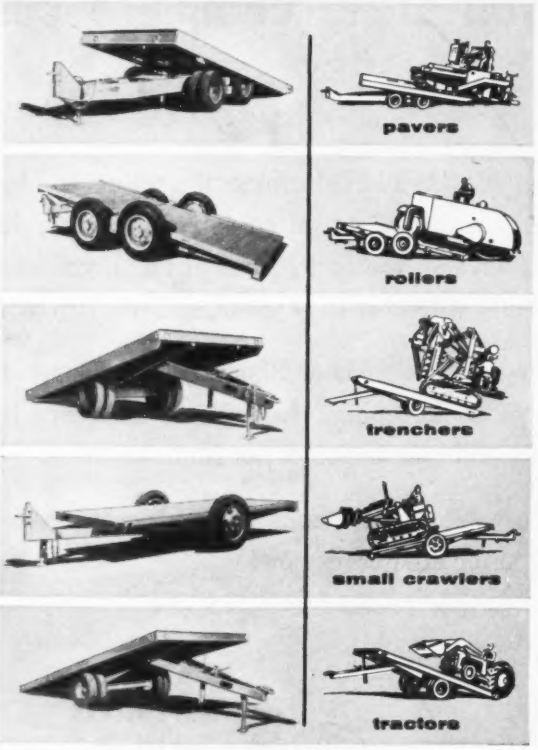
"OT-15"
Over-the-wheels, 8' x 16'-6" platform. 18' and 20' platforms available. Eight wheels, dual assemblies, mounted on tandem axles with oscillating walking beam. 15 ton capacity. Also available with gooseneck for tractor towing unit.

"BT-10" & "CT-7"
Extra low, load angle, between-the-wheels platform, 76" wide — either 14' or 16' long. Four single wheels mounted on tandem axles with oscillating walking beam. 10 ton capacity on "BT" . . . 7 ton on "CT".

"J-6", "8" & "10"
Heavy duty over-the-wheels models. 8' x 14' platform —16' and 18' platforms available. Single axle, dual wheels. Capacity: "J-6", 6 tons; "J-8", 8 tons; "J-10", 10 tons.

"C-4"
Extra low loading angle, between the wheels platform 8' x 14', 16' platform available. Two single wheels mounted on straight-thru H beam axle. 4 ton capacity.

"H-4"
Over-the-wheels, 8' x 14' platform — 16' platform available. Single straight-thru axle, dual wheels. Completely equipped with heavy duty, first line trailer tires. 4 ton capacity.



• A variety of Tilt-Top models equipped with single or tandem axles . . . over, or between-the-wheel platforms . . . put mobility under all sorts of equipment from 4 to 15 tons . . . save the extra loading time and extra cost of larger more cumbersome trailers. ONE man can tilt, drive on a rig and be off to the next job in less than TWO minutes. See your MILLER distributor now—find out how MILLER'S fast between job loading and hauling . . . can often help you to save duplicating expensive equipment on several jobs.

✓built best
✓priced best
See your MILLER distributor or write for FREE literature to:

Miller® Tilt-Top Trailer Inc.
457-C S. 92nd St., Milwaukee 14, Wisconsin

SOME BIG CONTRACT AWARDS OF THE MONTH

Missouri Valley Dredging Co., 1331 S. 20th St., Omaha, Neb. Products pipeline, 440 mi, from Philadelphia to Cleveland. Laurel Pipe Line Co., 402 Dauphin Bldg., Harrisburg, Pa. $50,000,000.

Turner Constr. Co., 150 E. 42nd St., New York 17, N. Y. A 60-story office building at 31 W. 51 St. for Galbreath Corp., 150 E. 42nd St., New York 17, N. Y. $40,000,000.

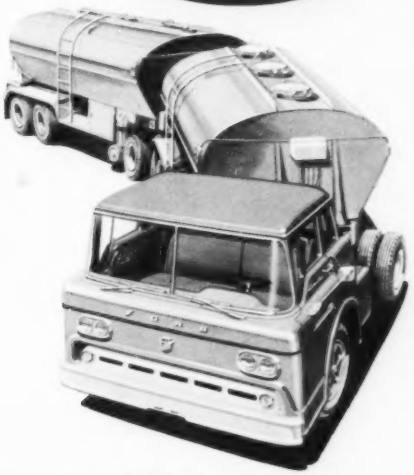
Daniel Constr. Co., 822 7 Ave. S., Birmingham, Ala. Ten mill buildings and supporting facilities at Aluminum reduction plant, Listerhill, Ala. Reynolds Metals Co., Reynolds Metals Bldg., Richmond, Va. $20,000,000.

Walsh Constr. Co., 711 Third Ave., New York 17, N. Y. Four research buildings, one utilities building and a four-story office building at Greenburg, N. Y. Union Carbide Corp., 30 E. 42nd St., New York 17, N. Y. $14,180,000.

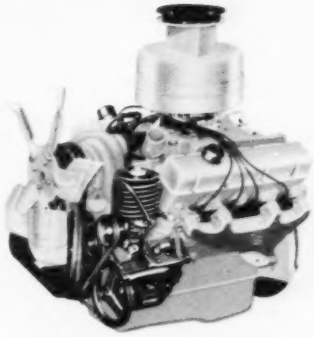
American Bridge Div., U. S. Steel Corp., 71 Broadway, New York, N. Y. International suspension bridge over St. Lawrence River between Chimney Rock, N. Y., and Grenville, Ont., Canada. New York State Dept. of Public Works, Albany, N. Y. $5,742,755.

FORD

1958 EXTRA HEAVY DUTY TRUCKS
WITH NEW SUPER DUTY V-8's

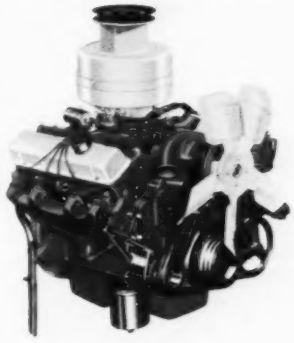


C-850
C-950
C-1000
C-1100



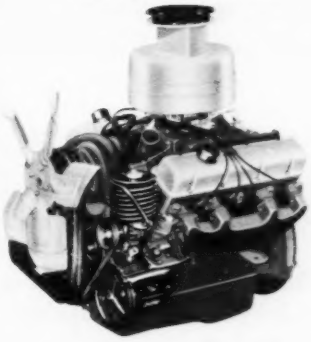
277-hp 534 SD V-8

F-850
F-950
F-1000
F-1100



260-hp 477 SD V-8

T-850
T-950



226-hp 401 SD V-8

BIG TRUCK BUILT...BIG TRUCK POWERED...AT FORD'S LOW PRICES!

FORD TRUCKS COST LESS

...LESS TO OWN *...LESS TO RUN* *...LAST LONGER, TOO!*

NEW FORD EXTRA HEAVIES

FORD T-950 tandem dump truck with up to 51,000-lb. GVW, up to 277-hp Super Duty V-8 available. GCW 75,000 lb.

FORD C-1000 Tilt Cab tractor with big 260-hp Super Duty V-8 engine. Maximum GCW 65,000 lb. with optional axle, GVW 31,000 lb.

FORD F-1100 conventional with 277-hp Super Duty V-8 standard. Maximum GVW 36,000 lb. with optional 29,000-lb. rear axle.

Step in . . . the new Ford Extra Heavy Duty trucks for '58—the all-new, more rugged line with huge payload capacities for on-highway or off-the-road service. *Step ahead* with Ford's more-for-your-money features. Meet America's most modern *big* trucks for '58. Discover the new advances in this pace-setting Extra Heavy Duty line of Conventionals, Tilt Cabs and Tandems.

They're new in power, too! Ford now offers three mighty new Super Duty V-8's. Extra rugged, modern big engines with up to 534-cubic inch displacement . . . up to 277 horsepower! And "over square" (bore larger than stroke) Short Stroke design provides maximum power, durability and economy.

Saddle-type, step-type and cylindrical fuel tanks are available, complete with electric fuel pumps for extra dependability. Mighty Super Duty engines and Ford Extra Heavy Duty chassis form a combination of power and ruggedness that can't be beat. Springs, axles, brakes—all components are engineered to give exceptional service. All the new Ford advancements for '58 mean *Ford Trucks Cost Less* . . . less to own . . . less to run . . . last longer, too!

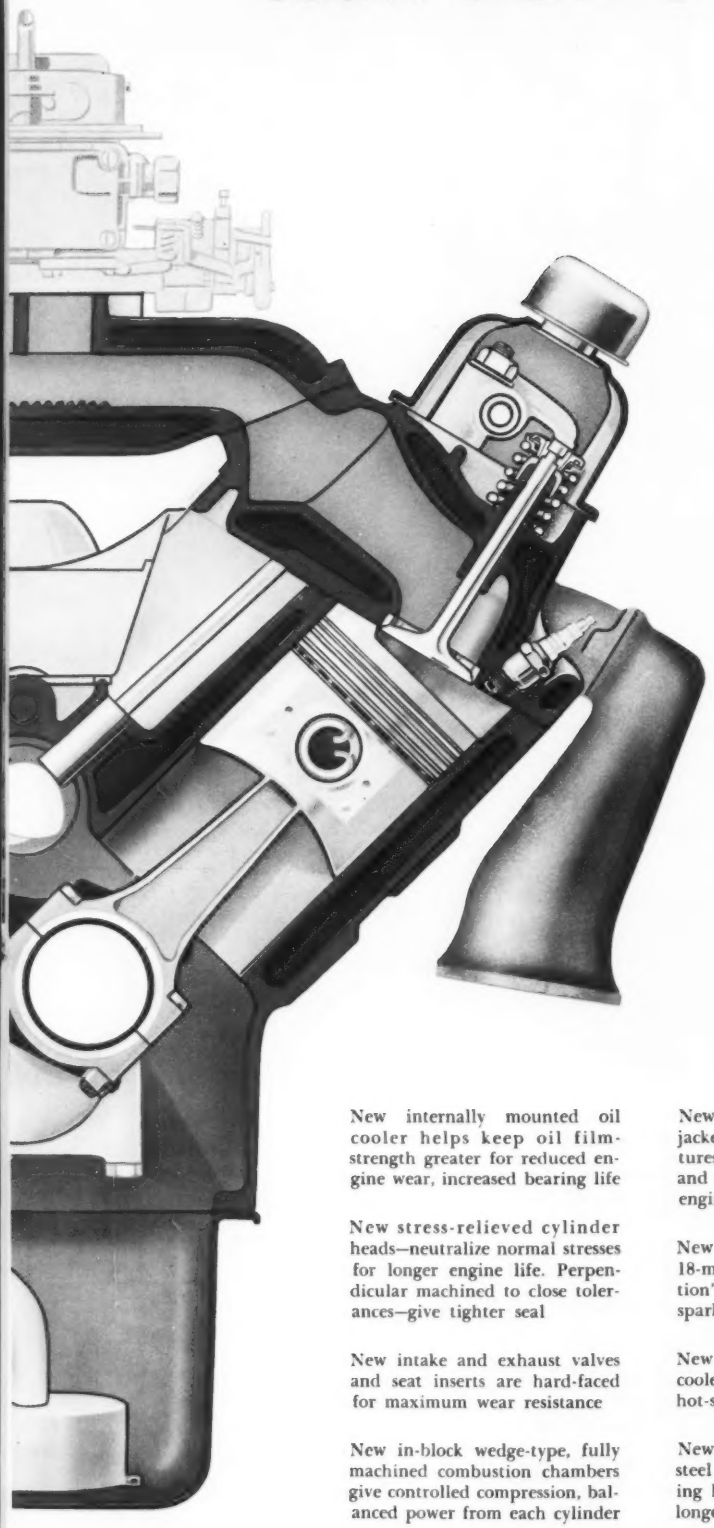
QUICK FACTS

CONVENTIONAL MODELS	ENGINE		REAR AXLE		MAX. TIRES	GVW'S (lb.)		GCW'S (lb.)	
	Standard	Optional	Standard	Optional		Standard	Optional	Standard	Optional
F-1100	277-hp 534 V-8		22,000 lb.	29,000 lb.*	12 x 24.5—12 PR	30,000	36,000	65,000	
F-1000	260-hp 477 V-8		21,000 lb.	22,000 lb.	12 x 24.5—12 PR	30,000		55,000	65,000
F-950	226-hp 401 V-8		21,000 lb.		12 x 24.5—12 PR	29,000		55,000	
F-850	226-hp 401 V-8		18,000 lb.		11 x 22.5—12 PR	25,000		50,000	
TILT CAB MODELS									
C-1100	277-hp 534 V-8		22,000 lb.	29,000 lb.**	12 x 24.5—12 PR	31,000	36,000	65,000	
C-1000	260-hp 477 V-8		21,000 lb.	22,000 lb.	12 x 24.5—12 PR	31,000		55,000	65,000
C-950	226-hp 401 V-8		21,000 lb.		12 x 24.5—12 PR	30,000		55,000	
C-850	226-hp 401 V-8		18,000 lb.		11 x 22.5—12 PR	26,000		50,000	
TANDEM MODELS	•								
T-950	226-hp 401 V-8	260-hp 477 V-8 277-hp 534 V-8	38,000 lb.		12 x 24.5—12 PR	46,000	48,000 51,000	75,000	
T-850	226-hp 401 V-8	260-hp 477 V-8 277-hp 534 V-8	34,000 lb.	28,000 lb.	11 x 22.5—12 PR	43,000	37,000 45,000	— 70,000	55,000 —

*Not available on 132" wb. model.

**Not available on 99" wb. model.

Now from FORD . . . durable



Big, modern all-truck engines! Up to 534-cu. in. Displacement . . . 277 Horsepower for New Ford Extra Heavy Duty Models

New Ford Super Duty V-8's have up to 534-cubic inch displacements . . . up to 277 horsepower for rugged performance. Three great new "over square" (bore larger than stroke) Short Stroke V-8 truck engines for new Ford Extra Heavy Duty models. The most modern, most efficient gasoline engines in their field. They're ultra-modern . . . designed for today's hauling needs.

Engineered to develop more horsepower per pound, with rugged new durability features for longer-lasting dependability. And for routine maintenance their clean, simple design gives maximum accessibility for servicing. Powerful new Ford Super Duty V-8's have been thoroughly road tested by leading truck fleets, coast to coast . . . they're ready to bring you new power, durability and economy!

New internally mounted oil cooler helps keep oil film-strength greater for reduced engine wear, increased bearing life

New stress-relieved cylinder heads—neutralize normal stresses for longer engine life. Perpendicular machined to close tolerances—give tighter seal

New intake and exhaust valves and seat inserts are hard-faced for maximum wear resistance

New in-block wedge-type, fully machined combustion chambers give controlled compression, balanced power from each cylinder

New intake manifold—water-jacketed for stabilized temperatures . . . aids high horsepower and torque output, improves engine economy

New spark plug accessibility—18-mm. plugs with "Turbo Action" resist fouling, give positive spark action

New alternately spaced sodium-cooled exhaust valves reduce hot-spot dangers, last longer

New externally balanced, forged-steel crankshaft equalizes bearing loads for greater durability, longer bearing life

New Turbulence-Top pistons for maximum power, top ring groove carrier for extended groove life and thermal-controlled integral strut for better piston sizing

New, stronger "pyramid" connecting rods—hollow-milled for better balance

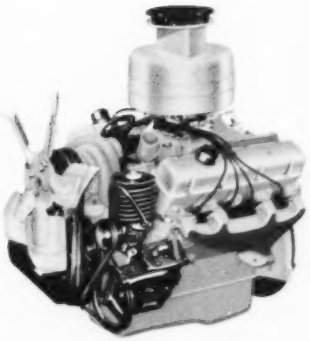
New extra-large Full-Flow oil filter—big 2-quart capacity for double filtering area

New high-capacity rotor-type oil pump mounted within the oil pan for more efficient lubrication system

FOR INDUSTRIAL ENGINE APPLICATION WRITE TO: INDUSTRIAL ENGINE DEPARTMENT, FORD DIVISION OF FORD MOTOR CO., P. O. BOX 598 DEARBORN, MICHIGAN

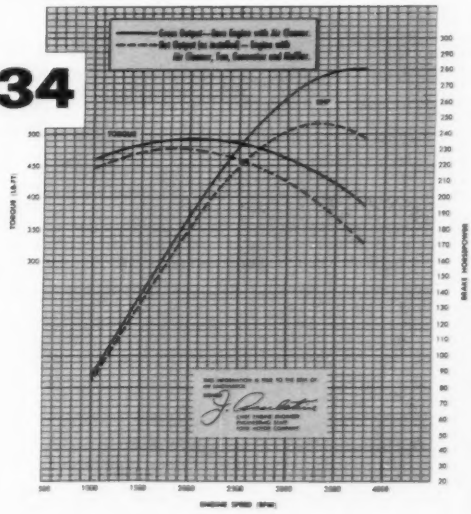
new Super Duty power

534



277-hp 534 SD V-8
Brake Horsepower—277 @ 3400 rpm
Torque—490 lbs-ft @ 1800-2300 rpm
Bore—4.50 in. **Stroke**—4.20 in.

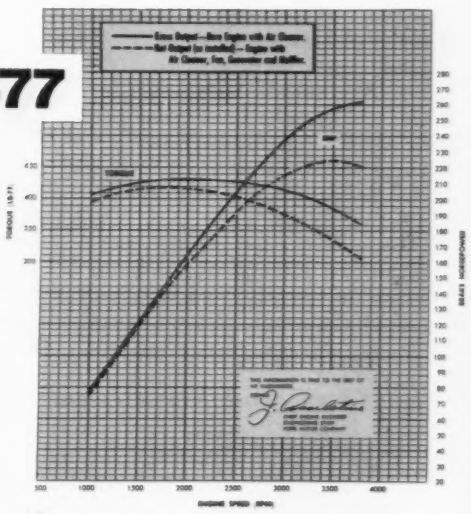
The big, new Ford 534 is an "over square" Short Stroke engine, like all Ford Super Duty V-8's. Here's snappy power, long-lasting durability and top economy. Standard in Ford F-1100, C-1100 trucks. Optional in T-850, T-950 tandems.



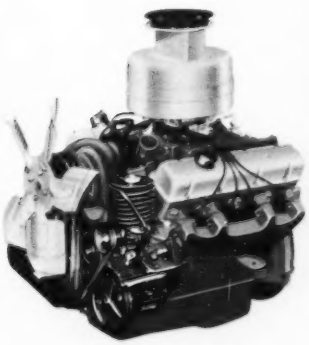
477

260-hp 477 SD V-8
Brake Horsepower—260 @ 3600 rpm
Torque—430 lbs-ft @ 1800-2300 rpm
Bore—4.50 in. **Stroke**—3.75 in.

Now . . . 477 cubic inches of super power for your Extra Heavy Duty needs! Notice the high and flat torque curve (power curve at right) to insure maximum performance. Standard engine in Ford F-1000, C-1000 trucks. Optional T-850, T-950 tandem models.

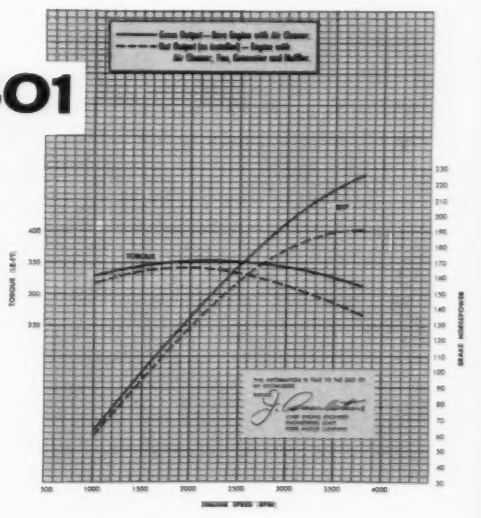


401

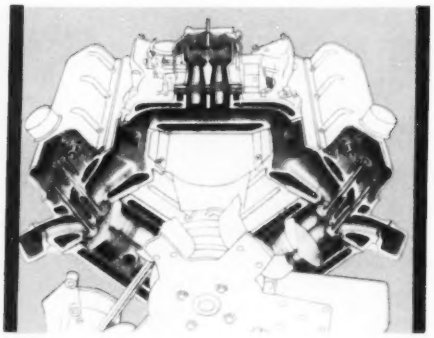


226-hp 401 SD V-8
Brake Horsepower—226 @ 3800 rpm
Torque—350 lbs-ft @ 1800-2300 rpm
Bore—4.12 in. **Stroke**—3.75 in.

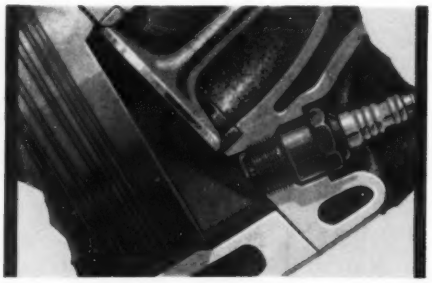
For higher earnings every trip, Ford Super Duty V-8's like this popular 401-cubic inch engine provide the best horsepower to weight ratios obtainable in comparable all-truck engines today. Standard in Ford F-, C- & T-850 and 950 models.



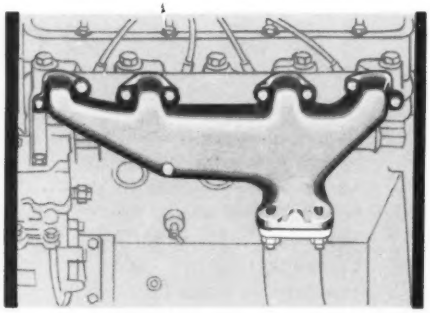
Outstanding new FORD V-8



NEW INTAKE MANIFOLDING—Much of the exceptional performance of Ford's new Super Duty V-8's can be traced to their free-breathing design. Thermostatically controlled carburetor air intake, Super-Filter air cleaner, 4-barrel carburetor, simplified intake manifold with water-jacketed passages and large intake valves—provide high intake efficiency. The modern single-bridge intake manifold distributes the fuel-air mixture more evenly for smoother performance. And its water-jacketed passages provide a more uniform fuel-air temperature.

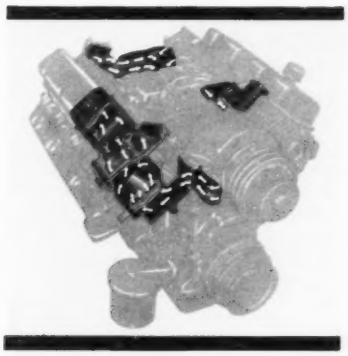


MACHINED COMBUSTION CHAMBERS—New wedge-shape combustion chambers are fully machined for accurate volume and compression control. Completely in the block, there's less heat in the heads for improved valve cooling. The face of the head is flat-machined at 90° for positive mating with the block. The new wedge-shape chamber design together with Turbulence-Top piston heads gives better fuel-air turbulence for snappy power and minimized combustion deposits, and advanced "over square" (bore larger than stroke) Short Stroke engine design increases usable horsepower and torque . . . cuts internal friction for long engine life and greater fuel economy.



LOW BACK-PRESSURE EXHAUST MANIFOLDING—Improved exhaust manifolding reduces back pressure . . . means more usable power and longer engine life. For full performance, burned gases must be properly removed to make room for a fresh charge of fuel-air mixture. And on the new Ford Super Duty V-8 engines exhaust gases leave through large exhaust ports, down wide passages in the cylinder head to the generously sized exhaust manifolds and out dual exhaust pipes to complete the breathing cycle most efficiently.

DESIGN features



MODERN 3-STAGE PARALLEL FLOW COOLING

1. HEAD – For cold starts, both thermostats are closed and the coolant is pumped through the cylinder head and manifold water jacket, returning through a bypass to the pump. This restricted flow continues until the coolant reaches 140°. The rapid head warm-up preheats the fuel-air mixture for more efficient burning and greater power. Fast block warm-up also occurs, warming the oil for better lubrication.

2. HEAD AND BLOCK–At 140°, the back thermostat opens allowing coolant to circulate more rapidly through the block. The coolant flows through the head, block and intake manifold water jacket, but closed front thermostat prevents it from flowing through the radiator. It returns through a bypass to the water pump and is recirculated. This continues until the coolant in the intake manifold reaches 160°.

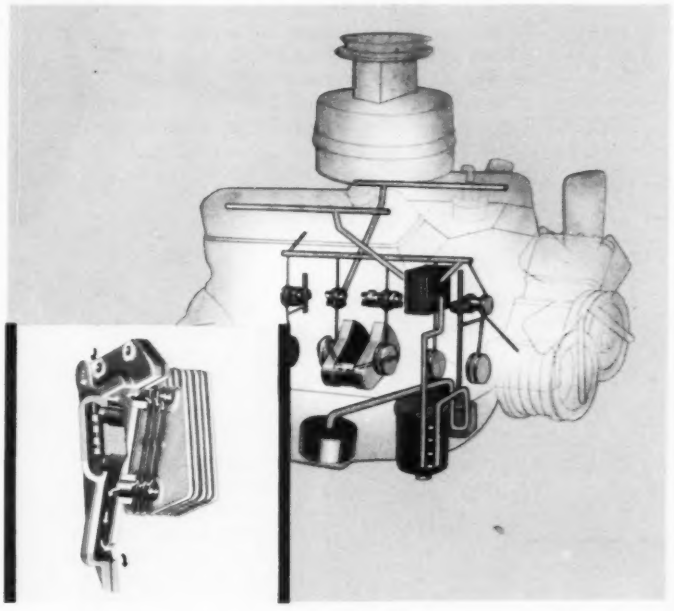
3. COMPLETE COOLING – At 160°, the front thermostat opens allowing the coolant to flow through the radiator and the entire cooling system. Approximately half of the coolant is directed to the heads and the other half to the block. This 3-stage system gives fast engine warm-up and effective cooling. Over ten thousand gallons of coolant per hour are pumped by the durable, high-capacity water pump.

NEW LUBRICATION SYSTEM

FULL-PRESSURE LUBRICATION SYSTEM – Oil is pumped under pressure through galleries in the block and head to the crankshaft main and connecting rod journals, camshaft journals, rocker shaft and arms, air compressor and timing gears. Valve stems, cam lobes, piston pins and valve lifters are effectively splash and gravity lubricated. Squirt holes in the connecting rods direct oil to cylinder walls.

Troublesome external oil lines have been virtually eliminated. And all oil is filtered passing through the large 2-quart Full-Flow oil filter.

INTERNAL OIL COOLING–A tremendous "plus" of the Ford lubrication system is the easily accessible internally mounted oil cooler. Standard equipment on all Super Duty V-8's, it's designed to keep the engine's oil at proper temperatures in extra-heavy-duty service. The oil cooler reduces oil temperatures to minimize carbonization . . . promotes greater oil film-strength . . . prolongs moving part life, main bearing, etc. . . . and extends time between oil changes.

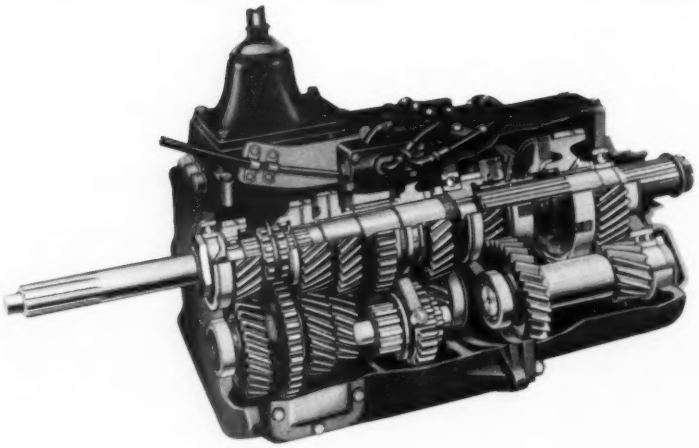


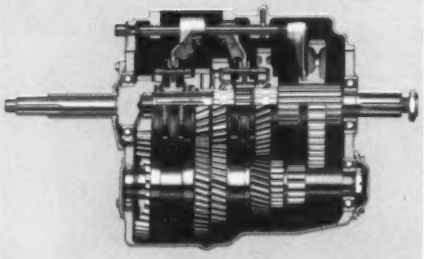
TWO-PLATE 13" CLUTCH — New, solid dual disc 13-inch clutch provides dependable, positive operation. Direct pressure is applied to the pressure plate by 12 coil springs. And the large facing area with two-plate design gives high torque capacity and long service.

For your extra-heavy-duty needs, Ford offers a wide selection of power train components designed for your individual requirements. Extra strength and capacity is engineered into each and every part to take the tremendous horsepower and torque output of the new Ford Super Duty engines . . . and to stand up under the big payloads Ford Extra Heavy Duty trucks are rated to haul. Transmissions, auxiliaries, clutches and Single- or Two-Speed rear axles are all engineered for outstanding performance and long, dependable service.

Extra strength in every

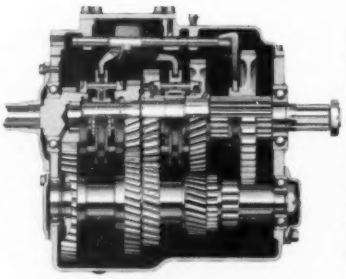
8-SPEED ROADRANGER — Designed for extra-heavy-duty over-the-road service, the Roadranger transmission provides 8 evenly spaced, progressive gear ratio steps. A four-speed constant mesh main gear box is coupled with an integrally mounted, synchronized Two-Speed reduction unit . . . giving 8 forward speeds to get loads under way faster and maintain highway speeds better. Shifting is powered by air, manually controlled by a convenient switch on the shift lever.





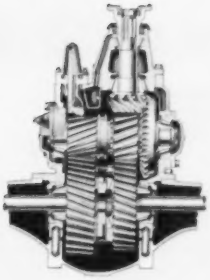
4000 SERIES SPICER TRANSMISSIONS

5-Speed Synchro-Silent, Direct-in-fifth transmissions are offered in a wide-ratio version, for use primarily with Single-Speed rear axles or with Two-Speed axles for off-the-road use. Close-ratio version for use with Two-Speed axles over-the-road.



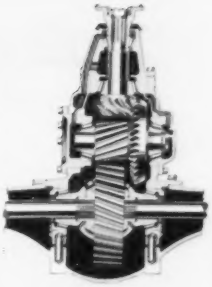
6000 SERIES SPICER TRANSMISSIONS

5-Speed Synchro-Silent, Direct-in-fifth or Overdrive-in-fifth (reduces engine revolutions about 17%) transmissions. Direct Drive is offered in both wide-ratio and close-ratio versions. Overdrive is close-ratio only.



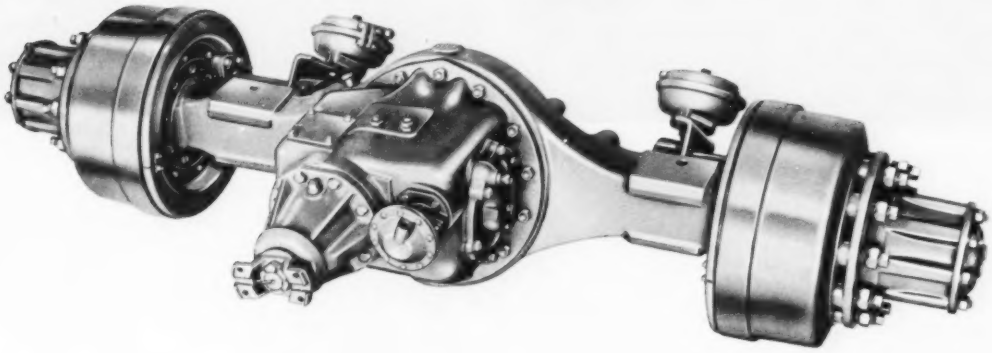
U-200

Rugged Single-Speed, double reduction, 29,000-lb. hypoid rear axle. Available with 6352 transmission on F- & C-1100 models. Not available on 99″ or 132″ wb. models.

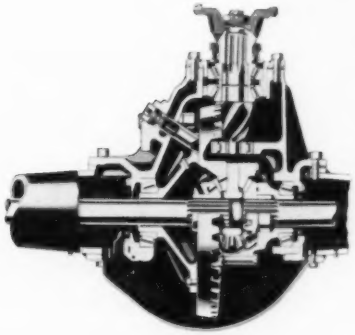


U-300

Big capacity Two-Speed, double reduction, 29,000-lb. hypoid rear axle. Available on F- & C-1100 models with 6352 transmission. Not available on 99″ or 132″ wb. models.

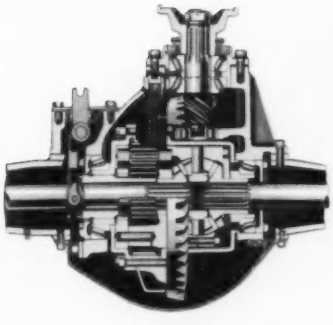


POWER TRAIN component



18,000-LB. SINGLE-SPEED
21,000-LB. SINGLE-SPEED
22,000-LB. SINGLE-SPEED

Spiral bevel, full-floating rear axle. Pinion is straddle-mounted for accurate alignment under high torque loads. All gears are alloy-steel, carburized and hardened for strength and wear resistance. And extra-capacity tapered-roller wheel bearings provide long, dependable service.



18,000-LB. TWO-SPEED
21,000-LB. TWO-SPEED
22,000-LB. TWO-SPEED

Spiral bevel, Two-Speed, full-floating rear axles. A planetary reduction gear set between the ring gear and differential provides two selective ratios for greater flexibility of truck operation. Easy to operate, positive-action, electric-shift control allows fast, easy shifting.

FORD Extra Heavy Duty

Double-Channel frame side rails provide a solid foundation for the bigger payloads and rugged dependability you get with Ford's Extra Heavy Duty models—both Conventional and Tilt Cab! Strong clean-cut chassis design pares away useless, unwanted dead weight, let's you carry more payload on every trip. Yet there's plenty of extra toughness where it counts. Ford's springs, frames and axles, unit for unit more durable, all have the reserve capacity to keep your loads rolling in all kinds of going.

F-850 Chassis Shown

CONVENTIONAL AND TILT CAB CHASSIS FEATURES:

Large-capacity flat tube-and-fin radiator with cylindrical top tank gives high cooling efficiency. Durable U-type rubber-cushioned support.

High-capacity, wide-tread, set-back front axle for shorter turning, more steering stability and improved weight distribution.

Durable tie-rod ends are spring-loaded, ball-socket type with dust shields, for automatic wear take-up.

Channel front bumper attached directly to frame, for greater rigidity.

Synchro-Silent type transmission is standard on all models to provide faster, easier shifting—up or down—with less loss of truck momentum, less driver effort.

Straight-line drive with large diameter tubular propeller shafts gives smooth power flow.

Resilient rubber cushion encases center bearing, absorbs up to 80% of propeller shaft vibration.

Wide-span rear and auxiliary springs provide sturdy, balanced support and smooth ride.

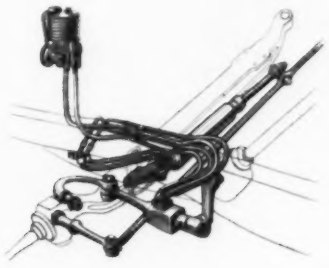
Single-Speed rear axle with one-piece banjo housing, standard; electric-shift, Two-Speed planetary type available.

C-950 Chassis Shown

chassis construction

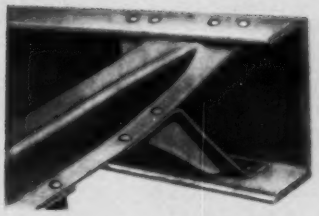
New Front Axles with modified I-beam construction, reinforced at stress points for extra durability. Available in 7000-, 9000-, 11000- and 15000-lb. capacities.

Roll-Action Steering with worm-and-roller type steering gear reduces friction, makes steering easier. Needle-bearing roller provides rolling rather than sliding action.

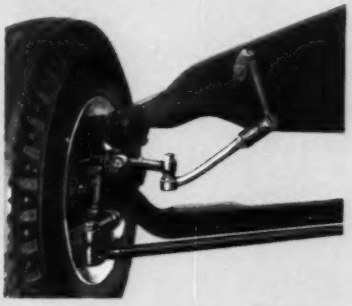


Master-Guide Power Steering is available on all F- and C-Series Extra Heavy Duty models . . . cuts steering effort as much as 75%.

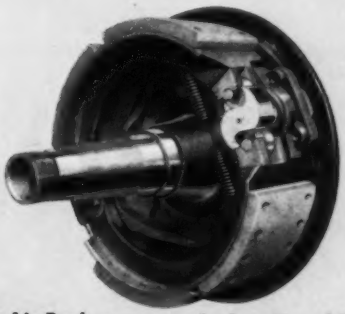
New Electric Fuel Pump mounted in fuel tank. Big capacity, submerged-type fuel pump delivers only liquid fuel—no vapor—under pressure from tank to carburetor. Not dependent on engine rpm's . . . provides ample fuel at any vehicle speed.



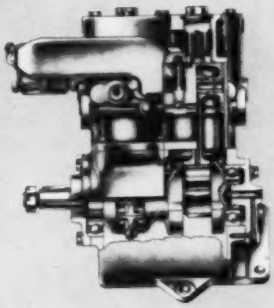
Double-Channel Frame Rails are engineered for extra strength and are highly resistant to twist and weave. Side rails have full channel reinforcement from front to rear springs.



Steering Linkage, solid Direct-Acting drag link, U-type steering arm and adjustable tie rod give excellent steering control and maneuverability.

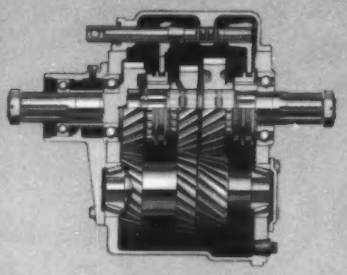


Full-Air Brakes are standard on F- and C-1000 and 1100 models, available 850 and 950. Compressor, two reservoir tanks, buzzer low-pressure indicator and air-operated windshield wipers included.

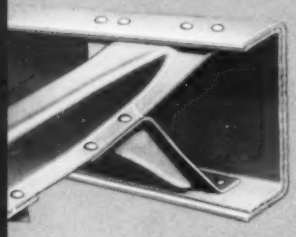


Big 12-cubic foot Air Compressor is available in place of standard 7¼-cu. ft. with full-air brakes on F- and C-950 thru 1100. Large 12-cubic foot per minute capacity provides extra safety factor.

FORD Tandem Chassis for

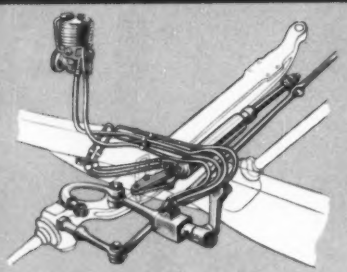


Two all-helical, 3-Speed Auxiliary constant mesh transmissions are available (except 144" wb. T-850) for greater operating flexibility.



Double-Channel frame side rails for extra strength, lower weight. Channel-reinforced from front spring to end of frame.

Roadranger Transmission with 8 closely spaced forward speeds and preselect range shifting is optional for all models. Not offered with auxiliary transmission.



Master-Guide Power Steering standard . . . always operative, cuts steering effort up to 75%.

Large capacity flat-tube radiator with cylindrical top tank gives high cooling efficiency. Durable U-type support.

High-capacity, wide-tread, set-back front axle provides shorter turning, more stability, improved weight distribution.

Durable tie-rod ends are spring-loaded, ball-socket type with dust shields, for automatic wear take-up.

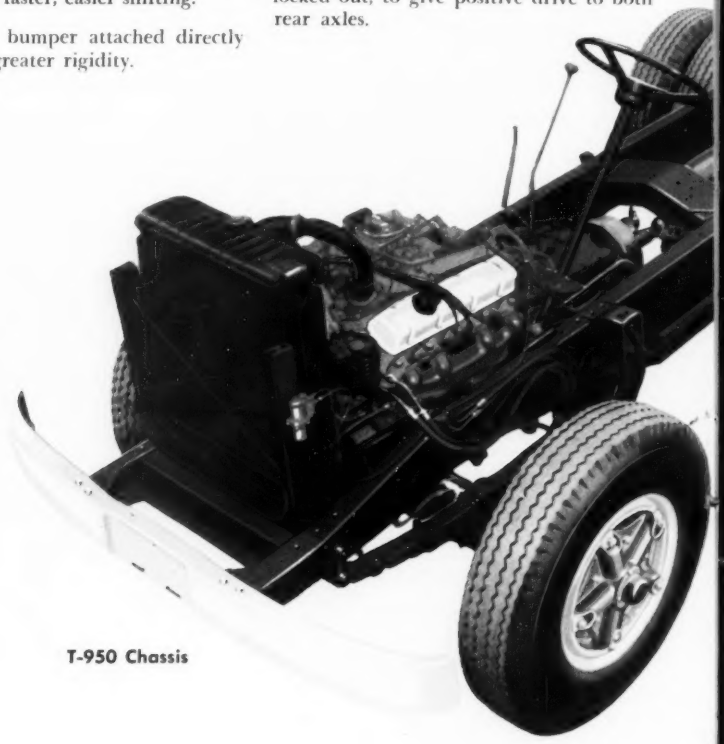
Synchro-Silent 5-Speed direct transmission is standard for faster, easier shifting.

Channel front bumper attached directly to frame, for greater rigidity.

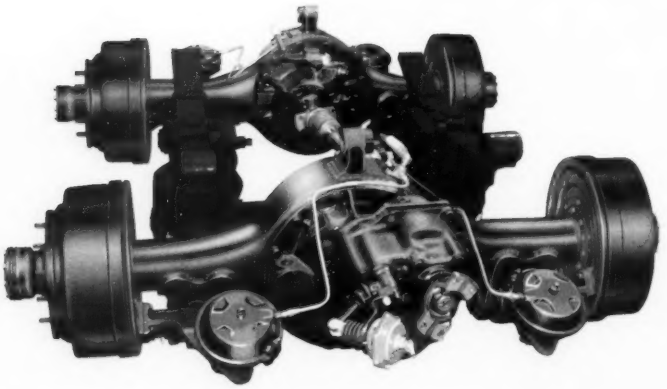
Tubular propeller shafts, large diameter, non-whipping. Long-lived needle-bearing joints. Rubber-encased drive line center bearing for longer life.

Torque arms absorb starting and stopping thrusts. Arms are rubber bushed at each end, and need no lubrication.

Power divider, provided with 3rd differential, equalizes the driving power between axles, eliminates axle fight for longer gear and tire life. The third differential may be locked out, to give positive drive to both rear axles.



T-950 Chassis



38D—38,000-lb. Tandem Axle (Std. T-950). Full-floating straight through drive axle with Single-Speed power divider on forward rear axle. Available with a choice of single reduction and planetary double reduction ratios. Equipped with full-air brakes.

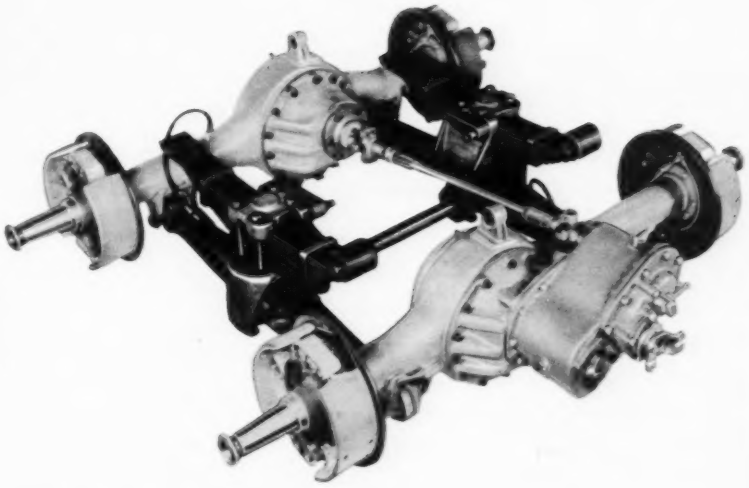
extra payloads

More flotation is provided by eight rear tires . . . keeps truck from bogging down in mud, sand and other soft footing where single-rear-axle trucks would normally flounder. Walking-beam action levels bumps by 50%, minimizes "bounce."

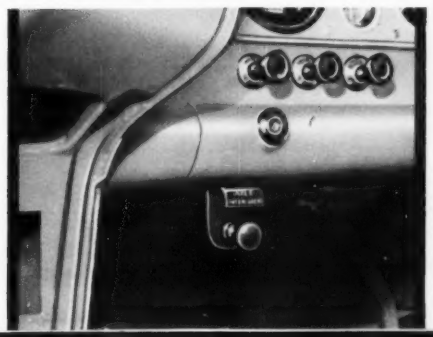
28M—28,000-lb. Tandem Axle (Opt. T-850). Full-floating, single reduction type with a Single-Speed power divider mounted on forward rear axle. Available with hydraulic or full-air brakes. Hypoid ring gear and pinion gear sets.

Two equalizing beams provide true axle alignment, distribute weight between axles. Rubber bushings do away with the need for lubrication.

Husky, short-coupled springs minimize side-sway, absorb road shocks, give smooth, level ride.



34M—34,000-lb. Tandem Axle (Std. T-850). Full-floating, single reduction type with a Single-Speed power divider mounted on forward rear axle. Available with hydraulic or full-air brakes. Spiral bevel ring gear and pinion gear sets.



Differential lockout control located on the instrument panel permits driver to lock out differential action giving each axle the same positive traction as if separately driven.

F-SERIES POWER TRAIN SELECTIONS

Engine—Transmission—Axle Ratio (to 1) Combinations

Transmission	F-850 with 401 SD V-8 Engine		F-950 with 401 SD V-8 Engine	
	18,000-lb. axle	18,000-lb. 2-Speed axle	21,000-lb. axle	21,000-lb. 2-Speed axle
4652	6.50 or 7.17	6.50/8.87 or 7.17/9.77*	6.50 or 7.17	6.50/8.87 or 7.17/9.77*
4756C	—	6.50/8.87 or 7.17/9.77*	—	6.50/8.87 or 7.17/9.77*
6352	6.50 or 7.17	6.50/8.87 or 7.17/9.77*	6.50 or 7.17	6.50/8.87 or 7.17/9.77*
6852G	—	6.50/8.87 or 7.17/9.77*	—	6.50/8.87 or 7.17/9.77*
6453A	6.50 or 7.17	6.50/8.87 or 7.17/9.77*	6.50 or 7.17	6.50/8.87 or 7.17/9.77*
R-46	6.50	—	6.50	—

Transmission	F-1000 with 477 SD V-8		F-1000 with 477 SD V-8 F-1100 with 534 SD V-8		F-1100 with 534 SD V-8	
	21,000-lb. axle	21,000-lb. 2-Speed axle	22,000-lb. axle	22,000-lb. 2-Speed axle	29,000-lb. axle	29,000-lb. 2-Speed axle
6352	6.50 or 7.17	6.50/8.87	6.17 or 6.67	6.14/8.36 or 6.71/9.13†	7.03	6.42/8.38 or 7.09/9.07
6852G	—	6.50/8.87	—	6.14/8.36 or 6.71/9.13†	—	—
6453A	6.50 or 7.17	6.50/8.87	6.17 or 6.67	6.14/8.36 or 6.71/9.13†	—	—
R-46	6.50	—	6.17 or 6.67	—	—	—

*Not recommended for tractor service.

†Not recommended for tractor service on F-1100 Series.

F-850 Specifications GVW 25,000 lb. • GCW 50,000 lb.

AXLE, FRONT
Standard Axle Capacity—lb. . . . 7,000
Optional Axle Capacity—lb. . . . 11,000
Includes 5,000-lb. front springs. Requires air brakes, power steering and cast spoke or 10-hole disc wheels.

AXLE, REAR
Capacity—lb. . . . 18,000
Standard—Type . . . Single Reduction—Spiral Bevel—Full-Floating
Axle Ratios . . . 6.50 or 7.17 to 1
Optional—Type . . . Two-Speed Planet—Full-Floating
Ratios (to 1) . . . 6.50/8.87 or 7.17/9.77*
*7.17/9.77 ratio not recommended for tractor service.

BRAKES, SERVICE
Standard—Type . . . Vacuum-Power Operated, Hydraulic, Two-Shoe
Front: Double Anchor. Rear: Two-Cylinder, Self-Energizing
Front Brake (Drum Dia. x Lining Width—Thickness)—in. . . . 16 x 2¾—0.25
Rear Brake (Drum Dia. x Lining Width—Thickness)—in. . . . 16 x 5—0.50
Total Area (Lining)—sq. in. . . . 488.6
Booster (Effective Diaphragm Dia.)—in. . . . 10¼
Optional—Type . . . Full-Air, Heavy-Duty Two-Shoe with Slack Adjusters, Air Gauge on Instrument Panel, Air Windshield Wipers and Air Warning Buzzer
Front Brake (Drum Dia. x Lining Width—Thickness)—in. . . . 16 x 2½—0.312
Rear Brake (Drum Dia. x Lining Width—Thickness)—in. . . . 16½ x 6—0.75
Total Area (Lining)—sq. in. . . . 579.3
Compressor . . . 7¾ cu. ft. per min.
Air Reservoir Tanks . . . Two—830-cu. in. Cap'y each

BRAKE, HAND
Standard—Type . . . Drum and Contracting Band at Rear of Transmission on Drive Line
Size (Drum Dia. x Lining Width, in.—Lining Area, sq. in.) . . . 10½ x 3—97.7
Optional—Type (with 6000 Series and R-46 Transmissions) . . . Internal Shoe
Size (Drum Dia. x Lining Width, in.—Lining Area, sq. in.) . . . 12 x 4—111.6

CLUTCH
Type . . . Hydraulically Operated, 13-in., Constant Pressure Two-Plate
Total Frictional Area—sq. in. . . . 378

COOLING SYSTEM
Type—Capacity—qt. . . . Three-Stage—46
Thermostats . . . Two, in Intake Manifold
Fan, Diameter—in. . . . 21—5-Blade

DRIVE LINE
Type . . . Hotchkiss, Straight-Line Drive
Propeller Shafts—Number . . . Two, Tubular, Forged-Steel Ends
Universal Joints—Number, Type . . . Three, Needle Roller Bearing
Center Bearing . . . Rubber-Encased Ball Type

ELECTRICAL SYSTEM
Battery . . . 12-Volt, 78-Plate, 70 Amp-Hr
Alternator . . . 50 Amp., 750 Watts
Headlights . . . Dual Sealed-Beam, Foot-Switch Beam Control
Starter . . . High Torque, Ignition Key Starter Control
Parking Lights; Left Combination Stop and Taillight; Instrument Lights; Ignition Switch with Key Lock; Circuit Breakers; Rectifier

ENGINE
Standard . . . 226-hp 401 Super Duty V-8

FRAME
Side Rails—Type . . . Parallel, Channel Section—Tapered Front and Rear
Max. Section (Depth x Flange x Thick.)—in. . . . 9.5 x 3.0 x 0.25
Reinforcement . . . Channel, Inside Side Rail
Max. Section (Depth x Flange x Thick.)—in. . . . 9.0 x 2.56 x 0.15
Section Modulus . . . 14.93
Cross Members—Type . . . Flanged "U" Type with Alligator Jaw or Channel Type

FUEL TANK (All Tanks include Electric Fuel Pumps)
18-gallon . . . Frame-Mounted, Left Side
Optional . . . 125-gal. Saddle Tanks; 100-gal. Step Tanks; 60-gal. Cylindrical Tank for Right and/or Left Side
(Cylindrical not avail. on 132" wb.; Step Tanks require Air Brakes)

SPRINGS

	Front	*Rear*	
Semi-Elliptic, Ford Alloy Steel		*Main*	*Auxiliary*
Length x Width—in.	52 x 3	56 x 3	37.5 x 3
Number of Leaves	7	10	7
Capacity at Spg. Pad (Norm. Defl.)—Per Spring	2500 lb.	7800 lb.	(combined)
Optional Spring Capacity	3000 lb.	8700 lb.	(combined)

STEERING
Standard—Type . . . Worm and Dual Row Needle Bearing Roller
Wheel—Over-all Ratio . . . 20-in. Dia., 3-Spoke—20.5 to 1

Wheelbase	132"	144"	156"	175"	192"
Turning Circle Dia., Right or Left—ft.	46.2	49.5	52.8	58.0	62.7

Optional—Type . . . Master-Guide Power Steering

TRANSMISSION
Standard . . . Spicer 4652 5-Speed Synchro-Silent Direct-In-Fifth
Optional . . . Spicer 4756C 5-Speed Synchro-Silent Direct-In-Fifth
Optional . . . Spicer 6352 5-Speed Synchro-Silent Direct-In-Fifth
Optional . . . Spicer 6852G 5-Speed Synchro-Silent Direct-In-Fifth
Optional . . . Spicer 6453A 5-Speed Synchro-Silent Overdrive
Optional . . . 8-Speed R-46 Roadranger (6.50 axle ratio and air brakes required)

Gear Positions	*First*	*Second*	*Third*	*Fourth*	*Fifth*	*Reverse*
Ratios (to 1):						
4652 5-Speed Direct	7.40	4.00*	2.47*	1.46*	1.00*	7.84
4756C 5-Speed Direct	6.50	3.52*	1.93*	1.17*	1.00*	6.88
6352 5-Speed Direct	7.31	4.09*	2.41*	1.44*	1.00*	7.33
6852G 5-Speed Direct	6.71	3.52*	1.97*	1.17*	1.00*	6.72
6453A 5-Speed Overdrive	6.07	3.40*	1.79*	1.00*	0.83*	6.09
8-Speed Roadranger	(9.78, 6.98, 4.99, 3.68, 2.66, 1.90, 1.36, 1.00, rev. 11.01)					

Power Take-Off Opening . . . SAE 6-Bolt, On Both Sides
*Synchronized Speeds.

WHEELS AND TIRES (Standard)
Wheels—Number—Type . . . Four—Cast Spoke
Rims—Number—Size . . . Seven—22.5 x 6.75
Tires—Number—Size . . . Six—10-22.5 10 PR

F-950 Specifications GVW 29,000 lb. • GCW 55,000 lb.

AXLE, FRONT
Standard Axle Capacity—lb. . . . 9,000
Optional Axle Capacity—lb. . . . 11,000
Includes 5,000-lb. front springs. Requires air brakes, power steering.

AXLE, REAR
Capacity—lb. . . . 21,000
Standard—Type . . . Single Reduction—Spiral Bevel—Full-Floating
Axle Ratios . . . 6.50 or 7.17 to 1
Optional Type . . . Two-Speed Planet—Full-Floating
Ratios (to 1) . . . 6.50/8.87 or 7.17/9.77*
*7.17/9.77 ratio not recommended for tractor service.

BRAKES, SERVICE
Standard—Type . . . Vacuum-Power Operated, Hydraulic, Two-Shoe
Front: Double Anchor. Rear: Two-Cylinder, Self-Energizing
Front Brake (Drum Dia. x Lining Width—Thickness)—in. . . . 16 x 2¾—0.25
Rear Brake (Drum Dia. x Lining Width—Thickness)—in. . . . 16 x 6—0.50
Total Area (Lining)—sq. in. . . . 556.2
Booster (Effective Diaphragm Dia.)—in. . . . 9½
Optional—Type . . . Full-Air, Heavy-Duty Two-Shoe with Slack Adjusters, Air Gauge on Instrument Panel, Air Windshield Wipers and Air Warning Buzzer
Front Brake (Drum Dia. x Lining Width—Thickness)—in. . . . 16¾ x 3½—0.44
Rear Brake (Drum Dia. x Lining Width—Thickness)—in. . . . 16½ x 6—0.75
Total Area (Lining)—sq. in. . . . 650.0
Compressor . . . 7¾ cu. ft. per min.
Air Reservoir Tanks . . . Two—1,150-cu. in. Cap'y each
Optional Compressor . . . 12 cu. ft. per min.

BRAKE, HAND
Standard—Type . . . Drum and Contracting Band at Rear of Transmission on Drive Line
Size (Drum Dia. x Lining Width, in.—Lining Area, sq. in.) . . . 10½ x 3—97.7
Optional—Type (with 6000 Series and R-46 Transmissions) . . . Internal Shoe
Size (Drum Dia. x Lining Width, in.—Lining Area, sq. in.) . . . 12 x 4—111.6

CLUTCH
Type . . . Hydraulically Operated, 13-in., Constant Pressure Two-Plate
Total Frictional Area—sq. in. . . . 378

COOLING SYSTEM
Type—Capacity—qt. . . . Three-Stage—46
Thermostats . . . Two, in Intake Manifold
Fan, Diameter—in. . . . 21—5-Blade

DRIVE LINE
Type . . . Hotchkiss, Straight-Line Drive
Propeller Shafts—Number . . . Two, Tubular, Forged-Steel Ends
Universal Joints—Number, Type . . . Three, Needle Roller Bearing
Center Bearing . . . Rubber-Encased Ball Type

ELECTRICAL SYSTEM
Battery . . . 12-Volt, 78-Plate, 70 Amp-Hr
Alternator . . . 50 Amp., 750 Watts
Headlights . . . Dual Sealed-Beam, Foot-Switch Beam Control
Starter . . . High Torque, Ignition Key Starter Control
Parking Lights; Left Combination Stop and Taillight; Instrument Lights; Ignition Switch with Key Lock; Circuit Breakers; Rectifier

ENGINE
Standard . . . 226-hp 401 Super Duty V-8

FRAME
Side Rails—Type . . . Parallel, Channel Section—Tapered Front and Rear
Max. Section (Depth x Flange x Thick.)—in. . . . 9.75 x 3.50 x 0.28
Reinforcement . . . Channel, Inside Side Rail
Max. Section (Depth x Flange x Thick.)—in. . . . 9.20 x 3.03 x 0.25
Section Modulus . . . 21.75
Cross Members—Type . . . Flanged "U" Type with Alligator Jaw or Channel Type

FUEL TANK (All Tanks include Electric Fuel Pumps)
18-gallon . . . Frame-Mounted, Left Side
Optional . . . 125-gal. Saddle Tanks; 100-gal. Step Tanks; 60-gal. Cylindrical Tank for Right and/or Left Side
(Cylindrical not avail. on 132" wb.; Step Tanks require Air Brakes)

SPRINGS

	Front	*Rear*	
Semi-Elliptic, Ford Alloy Steel		*Main*	*Auxiliary*
Length x Width—in.	52 x 3	56 x 3	37.5 x 3
Number of Leaves	7	10	7
Capacity at Spg. Pad (Norm. Defl.)—Per Spring	3000 lb.	9250 lb.	(combined)
Optional Spring Capacity	4000 lb.	10000 lb.	(combined)

STEERING
Standard—Type . . . Worm and Dual Row Needle Bearing Roller
Wheel—Over-all Ratio . . . 20-in. Dia., 3-Spoke—24.4 to 1

Wheelbase	132"	144"	156"	175"	192"
Turning Circle Dia., Right or Left—ft.	46.1	49.4	52.7	57.9	62.6

Optional—Type . . . Master-Guide Power Steering

TRANSMISSION
Standard . . . Spicer 4652 5-Speed Synchro-Silent Direct-In-Fifth
Optional . . . Spicer 4756C 5-Speed Synchro-Silent Direct-In-Fifth
Optional . . . Spicer 6352 5-Speed Synchro-Silent Direct-In-Fifth
Optional . . . Spicer 6852G 5-Speed Synchro-Silent Direct-In-Fifth
Optional . . . Spicer 6453A 5-Speed Synchro-Silent Overdrive
Optional . . . 8-Speed R-46 Roadranger (6.50 axle ratio and air brakes required)

Gear Positions	*First*	*Second*	*Third*	*Fourth*	*Fifth*	*Reverse*
Ratios (to 1):						
4652 5-Speed Direct	7.40	4.00*	2.47*	1.46*	1.00*	7.84
4756C 5-Speed Direct	6.50	3.52*	1.93*	1.17*	1.00*	6.88
6352 5-Speed Direct	7.31	4.09*	2.41*	1.44*	1.00*	7.33
6852G 5-Speed Direct	6.71	3.52*	1.97*	1.17*	1.00*	6.72
6453A 5-Speed Overdrive	6.07	3.40*	1.79*	1.00*	0.83*	6.09
R-46 8-Speed Roadranger	(9.78, 6.98, 4.99, 3.68, 2.66, 1.90, 1.36, 1.00, rev. 11.01)					

Power Take-Off Opening . . . SAE 6-Bolt, On Both Sides
*Synchronized Speeds.

WHEELS AND TIRES (Standard)
Wheels—Number—Type . . . Four—Cast Spoke
Rims—Number—Size . . . Seven—22.5 x 7.5
Tires—Number—Size . . . Six—11-22.5 12 PR

F-1000 Specifications

GVW 30,000 lb. • GCW 55,000 lb. (Opt. GCW 65,000 lb.*)

**Requires 22,000-lb. rear axle*

AXLE, FRONT
- Standard Axle Capacity—lb. ... 9,000
- Optional Axle Capacity—lb. ... 11,000
  - Includes 5,000-lb. front springs. Requires power steering.
- Optional Axle Capacity—lb. ... 15,000
  - Includes 6,800-lb. front springs. Requires power steering.

AXLE, REAR
- Capacity—lb. ... 21,000
- Standard—Type ... Single Reduction—Spiral Bevel—Full-Floating
  - Axle Ratios ... 6.50 or 7.17 to 1
- Optional—Type ... Two-Speed Planet—Full-Floating
  - Ratios (to 1) ... 6.50/8.87
- Optional Capacity—lb. ... 22,000
  - Type ... Single Reduction—Spiral Bevel—Full-Floating
    - Axle Ratios ... 6.17 or 6.67 to 1
  - Type ... Two-Speed Planet—Full-Floating
    - Ratios (to 1) ... 6.14/8.36 or 6.71/9.13

BRAKES, SERVICE
- Standard—Type ... Full-Air, Heavy-Duty Two-Shoe with Slack Adjusters, Air Gauge on Instrument Panel, Air Windshield Wipers and Air Warning Buzzer
- Front Brake (Drum Dia. x Lining Width—Thickness)—in. ... 16¼ x 3½—0.44
- Rear Brake (Drum Dia. x Lining Width—Thickness)—in. ... 16½ x 6—0.75
- Total Area (Lining)—sq. in. ... 650.0
- Compressor ... 7¼ cu. ft. per min.
- Air Reservoir Tanks ... Two—1,150-cu. in. Cap'y each
- Optional Brakes (w/9,000- or 11,000-lb. Front and 22,000-lb. Rear Axles)
  - Total Area (Lining)—sq. in. ... 718.2
- Optional Brakes (w/15,000-lb. Front and 21,000-lb. Rear Axles)
  - Total Area (Lining)—sq. in. ... 664.6
- Optional Brakes (w/15,000-lb. Front and 22,000-lb. Rear Axles)
  - Total Area (Lining)—sq. in. ... 732.8
- Optional Compressor ... 12 cu. ft. per min.

BRAKE, HAND
- Type ... Internal Shoe at Rear of Transmission on Drive Line
- Size (Drum Dia. x Lining Width, in.—Lining Area, sq. in.) ... 12 x 4—111.6

CLUTCH
- Type ... Hydraulically Operated, 13-in., Constant Pressure Two-Plate
- Total Frictional Area—sq. in. ... 378

COOLING SYSTEM
- Type—Capacity—qt. ... Three-Stage—46
- Thermostats ... Two, in Intake Manifold
- Fan, Diameter—in. ... 21—5-Blade

DRIVE LINE
- Type ... Hotchkiss, Straight-Line Drive
- Propeller Shafts—Number ... Two, Tubular, Forged-Steel Ends
- Universal Joints—Number, Type ... Three, Needle Roller Bearing
- Center Bearing ... Rubber-Encased Ball Type

ELECTRICAL SYSTEM
- Battery ... 12-Volt, 78-Plate, 70 Amp-Hr
- Alternator ... 50 Amp., 750 Watts
- Headlights ... Dual Sealed-Beam, Foot-Switch Beam Control
- Starter ... High Torque, Ignition Key Starter Control
- Parking Lights; Left Combination Stop and Taillight; Instrument Lights; Ignition Switch with Key Lock; Circuit Breakers; Rectifier

ENGINE
- Standard ... 260-hp 477 Super Duty V-8

FRAME
- Side Rails—Type ... Parallel, Channel Section—Tapered Front and Rear
  - Max. Section (Depth x Flange x Thick.)—in. ... 9.75 x 3.50 x 0.28
- Reinforcement ... Channel, Inside Side Rail
  - Max. Section (Depth x Flange x Thick.)—in. ... 9.20 x 3.03 x 0.25
- Section Modulus ... 21.75
- Cross Members—Type ... Flanged "U" Type with Alligator Jaw or Channel Type

FUEL TANK (All Tanks include Electric Fuel Pumps)
- 18-gallon ... Frame-Mounted, Left Side
- Optional ... 125-gal. Saddle Tanks; 100-gal. Step Tanks; 60-gal. Cylindrical Tank for Right and/or Left Side (Cylindrical not avail. on 132" wb.)

SPRINGS

	Front	Rear	
		Main	*Auxiliary*
Semi-Elliptic, Ford Alloy Steel			
Length x Width—in.	52 x 3	56 x 3	37.5 x 3
Number of Leaves	7	10	9
Capacity at Spg. Pad (Norm. Defl.)—Per Spg.	3000 lb.	9650 lb. (combined)	
Optional Spring Capacity	4000 lb.	10400 lb. (combined)	

STEERING
- Standard—Type ... Worm and Dual Row Needle Bearing Roller
- Wheel—Over-all Ratio ... 20-in. Dia., 3-Spoke—24.4 to 1

Wheelbase	132"	144"	156"	175"	192"
Turning Circle Dia., Right or Left—ft.	46.1	49.4	52.7	57.9	62.6

- Optional—Type ... Master-Guide Power Steering

TRANSMISSION
- Standard ... Spicer 6352 5-Speed Synchro-Silent Direct-In-Fifth
- Optional ... Spicer 6852G 5-Speed Synchro-Silent Direct-In-Fifth
- Optional ... Spicer 6453A 5-Speed Synchro-Silent Overdrive
- Optional ... 8-Speed R-46 Roadranger (6.17, 6.50 or 6.67 axle ratio required)

Gear Positions Ratios (to 1):	First	Second	Third	Fourth	Fifth	Reverse
6352 5-Speed Direct	7.31	4.09*	2.41*	1.44*	1.00*	7.33
6852G 5-Speed Direct	6.71	3.52*	1.97*	1.17*	1.00*	6.72
6453A 5-Speed Overdrive	6.07	3.40*	1.79*	1.00*	0.83*	6.09

- R-46 8-Speed Roadranger (9.78, 6.98, 4.99, 3.68, 2.66, 1.90, 1.36, 1.00, rev. 11.01)
- Power Take-Off Opening ... SAE 6-Bolt, On Both Sides

*Synchronized Speeds.

WHEELS AND TIRES (Standard)
- Wheels—Number—Type ... Four—Cast Spoke
- Rims—Number—Size ... Seven—22.5 x 7.5
- Tires—Number—Size ... Six—11-22.5 12 PR

F-1100 Specifications

GVW 30,000 lb. • GCW 65,000 lb. (Opt. GVW 36,000 lb.*)

**Requires 11,000-lb. front axle, 29,000-lb. rear axle, HD rear main springs and special frame*

AXLE, FRONT
- Standard Axle Capacity—lb. ... 9,000
- Optional Axle Capacity—lb. ... 11,000
  - Includes 5,000-lb. front springs. Requires power steering.
- Optional Axle Capacity—lb. ... 15,000
  - Includes 6,800-lb. front springs. Requires power steering.

AXLE, REAR
- Capacity—lb. ... 22,000
- Standard—Type ... Single Reduction—Spiral Bevel—Full-Floating
  - Axle Ratios ... 6.17 or 6.67 to 1
- Optional—Type ... Two-Speed Planet—Full-Floating
  - Ratios (to 1) ... 6.14/8.36 or 6.71/9.13*
- Optional Capacity—lb. ... 29,000**
  - Type ... Double Reduction—Hypoid, Helical—Full-Floating
    - Axle Ratios ... 7.03 to 1
  - Type ... Two-Speed Double Reduction—Full-Floating
    - Ratios (to 1) ... 6.42/8.38 or 7.09/9.07

*6.71/9.13 ratio not recommended for tractor service.
**With 6352 Transmission only. Not available with 132" wb.

BRAKES, SERVICE
- Standard—Type ... Full-Air, Heavy-Duty Two-Shoe with Slack Adjusters, Air Gauge on Instrument Panel, Air Windshield Wipers and Air Warning Buzzer
- Front Brake (Drum Dia. x Lining Width—Thick.)—in. ... 16¼ x 3½—0.312
- Rear Brake (Drum Dia. x Lining Width—Thick.)—in. ... 16½ x 7—0.75
- Total Area (Lining)—sq. in. ... 718.2
- Compressor ... 7¼ cu. ft. per min.
- Air Reservoir Tanks ... Two—1,150-cu. in. Cap'y each
- Optional Brakes (w/15,000-lb. Front and 22,000- or 29-000-lb. Rear Axles)
  - Total Area (Lining)—sq. in. ... 732.8
- Optional Compressor ... 12 cu. ft. per min.

BRAKE, HAND
- Type ... Internal Shoe at Rear of Transmission on Drive Line
- Size (Drum Diameter x Lining Width, in.—Lining Area, sq. in.) ... 12 x 4—111.6

CLUTCH
- Type ... Hydraulically Operated, 13-in., Constant Pressure Two-Plate
- Total Frictional Area—sq. in. ... 378

COOLING SYSTEM
- Type—Capacity—qt. ... Three-Stage—47
- Thermostats ... Two, in Intake Manifold
- Fan, Diameter—in. ... 23—5-Blade

DRIVE LINE
- Type ... Hotchkiss, Straight-Line Drive
- Propeller Shafts—Number ... Two, Tubular, Forged-Steel Ends
- Universal Joints—Number, Type ... Three, Needle Roller Bearing
- Center Bearing ... Rubber-Encased Ball Type

ELECTRICAL SYSTEM
- Battery ... 12-Volt, 78-Plate, 70 Amp-Hr
- Alternator ... 50 Amp., 750 Watts
- Headlights ... Dual Sealed-Beam, Foot-Switch Beam Control
- Starter ... High Torque, Ignition Key Starter Control
- Parking Lights; Left Combination Stop and Taillight; Instrument Lights; Ignition Switch with Key Lock; Circuit Breakers; Rectifier

ENGINE
- Standard ... 277-hp 534 Super Duty V-8

FRAME
- Side Rails—Type ... Parallel, Channel Section—Tapered Front and Rear
  - Max. Section (Depth x Flange x Thick.)—in. ... 9.75 x 3.50 x 0.28
- Reinforcement ... Channel, Inside Side Rail
  - Max. Section (Depth x Flange x Thick.)—in. ... 9.20 x 3.03 x 0.25
- Section Modulus ... 21.75
- Cross Members—Type ... Flanged "U" Type with Alligator Jaw or Channel Type

FUEL TANK (All Tanks include Electric Fuel Pumps)
- 18-gallon ... Frame-Mounted, Left Side
- Optional ... 125-gal. Saddle Tanks; 100-gal. Step Tanks; 60-gal. Cylindrical Tank for Right and/or Left Side (Cylindrical not avail. on 132" wb.)

SPRINGS

	Front	Rear	
		Main	*Auxiliary*
Semi-Elliptic, Ford Alloy Steel			
Length x Width—in.	52 x 3	56 x 3	37.5 x 3
Number of Leaves	7	10	9
Capacity at Spg. Pad (Norm. Defl.)—Per Spg.	3000 lb.	9650 lb. (combined)	
Optional Spring Capacity	4000 lb.	10400 lb. (combined)	

STEERING
- Standard—Type ... Worm and Dual Row Needle Bearing Roller
- Wheel—Over-all Ratio ... 20-in. Dia., 3-Spoke—24.4 to 1

Wheelbase	132"	144"	156"	175"	192"
Turning Circle Dia., Right or Left—ft.	46.1	49.4	52.7	57.9	62.6

- Optional—Type ... Master-Guide Power Steering

TRANSMISSION
- Standard ... Spicer 6352 5-Speed Synchro-Silent Direct-In-Fifth
- Optional ... Spicer 6852G 5-Speed Synchro-Silent Direct-In-Fifth
- Optional ... Spicer 6453A 5-Speed Synchro-Silent Overdrive
- Optional ... 8-Speed R-46 Roadranger (6.17 or 6.67 axle ratio required)

Gear Positions Ratios (to 1):	First	Second	Third	Fourth	Fifth	Reverse
6352 5-Speed Direct	7.31	4.09*	2.41*	1.44*	1.00*	7.33
6852G 5-Speed Direct	6.71	3.52*	1.97*	1.17*	1.00*	6.72
6453A 5-Speed Overdrive	6.07	3.40*	1.79*	1.00*	0.83*	6.09

- R-46 8-Speed Roadranger (9.78, 6.98, 4.99, 3.68, 2.66, 1.90, 1.36, 1.00, rev. 11.01)
- Power Take-Off Opening ... SAE 6-Bolt, On Both Sides

*Synchronized Speeds.

WHEELS AND TIRES (Standard)
- Wheels—Number—Type ... Four—Cast Spoke
- Rims—Number—Size ... Seven—22.5 x 7.5
- Tires—Number—Size ... Six—11-22.5 12 PR

C-SERIES POWER TRAIN SELECTIONS
Engine—Transmission—Axle Ratio (to 1) Combinations

	C-850 with 401 SD V-8 Engine		C-950 with 401 SD V-8 Engine	
Transmission	**18,000-lb. axle**	**18,000-lb. 2-Speed axle**	**21,000-lb. axle**	**21,000-lb. 2-Speed axle**
4652	6.50 or 7.17	6.50/8.87 or 7.17/9.77*	6.50 or 7.17	6.50/8.87 or 7.17/9.77*
4756C	—	6.50/8.87 or 7.17/9.77*	—	6.50/8.87 or 7.17/9.77*
6352	6.50 or 7.17	6.50/8.87 or 7.17/9.77*	6.50 or 7.17	6.50/8.87 or 7.17/9.77*
6852G	—	6.50/8.87 or 7.17/9.77*	—	6.50/8.87 or 7.17/9.77*
6453A	6.50 or 7.17	6.50/8.87 or 7.17/9.77*	6.50 or 7.17	6.50/8.87 or 7.17/9.77*
R-46	6.50	—	6.50	—

	C-1000 with 477 SD V-8		C-1000 with 477 SD V-8 C-1100 with 534 SD V-8		C-1100 with 534 SD V-8	
Transmission	**21,000-lb. axle**	**21,000-lb. 2-Speed axle**	**22,000-lb. axle**	**22,000-lb. 2-Speed axle**	**29,000-lb. axle**	**29,000-lb. 2-Speed axle**
6352	6.50 or 7.17	6.50/8.87	6.17 or 6.67	6.14/8.36 or 6.71/9.13†	7.03	6.42/8.38 or 7.09/9.07
6852G	—	6.50/8.87	—	6.14/8.36 or 6.71/9.13†	—	—
6453A	6.50 or 7.17	6.50/8.87	6.17 or 6.67	6.14/8.36 or 6.71/9.13†	—	—
R-46	6.50	—	6.17 or 6.67	—	—	—

*Not recommended for tractor service.

†Not recommended for tractor service on C-1100 Series.

C-850 Specifications GVW 26,000 lb. • GCW 50,000 lb.

AXLE, FRONT
Standard Axle Capacity—lb. . . . 9,000
Optional Axle Capacity—lb. . . . 11,000
Includes 5,000-lb. front springs. Requires air brakes, power steering and cast spoke or 10-hole disc wheels.

AXLE, REAR
Capacity—lb. . . . 18,000
Standard—Type . . . Single Reduction—Spiral Bevel—Full-Floating
Axle Ratios . . . 6.50 or 7.17 to 1
Optional—Type . . . Two-Speed Planet—Full-Floating
Ratios (to 1) . . . 6.50/8.87 or 7.17/9.77*
*7.17/9.77 ratio not recommended for tractor service.

BRAKES, SERVICE
Standard—Type . . . Vacuum-Power Operated, Hydraulic, Two-Shoe
Front: Double Anchor. Rear: Two-Cylinder, Self-Energizing
Front Brake (Drum Dia. x Lining Width—Thickness)—in. . . . 16 x 2¼—0.25
Rear Brake (Drum Dia. x Lining Width—Thickness)—in. . . . 16 x 5—0.50
Total Area (Lining)—sq. in. . . . 488.6
Booster (Effective Diaphragm Dia.)—in. . . . 10¼
Optional—Type . . . Full-Air, Heavy-Duty Two-Shoe with Slack Adjusters, Air Gauge on Instrument Panel, Air Windshield Wipers and Air Warning Buzzer
Front Brake (Drum Dia. x Lining Width—Thickness)—in. . . . 16 x 2½—0.312
Rear Brake (Drum Dia. x Lining Width—Thickness)—in. . . . 16½ x 6—0.75
Total Area (Lining)—sq. in. . . . 579.3
Compressor . . . 7¼ cu. ft. per. min.
Air Reservoir Tanks . . . Two—830-cu. in. Cap'y each

BRAKE, HAND
Standard—Type . . Drum and Contracting Band at Rear of Transmission on Drive Line
Size (Drum Dia. x Lining Width, in.—Lining Area, sq. in.) . . . 10½ x 3—97.7
Optional—Type (with 6000 Series and R-46 Transmissions) . . . Internal Shoe
Size (Drum Dia. x Lining Width, in.—Lining Area, sq. in.) . . . 12 x 4—111.6

CLUTCH
Type . . . Hydraulically Operated, 13-in., Constant Pressure Two-Plate
Total Frictional Area—sq. in. . . . 378

COOLING SYSTEM
Type—Capacity—qt. . . . Three-Stage—51
Thermostats . . . Two, in Intake Manifold
Fan, Diameter—in. . . . 21—5-Blade

DRIVE LINE
Type . . . Hotchkiss, Straight-Line Drive
Propeller Shafts—Number, Type . . . (99" & 111" wb.) One, Tubular, Forged-Steel Ends (135" & 153" wb.) Two, Tubular, Forged-Steel Ends
Universal Joints—Number, Type . . . (99" & 111" wb.) Two, Needle Roller Bearing (135" & 153" wb.) Three, Needle Roller Bearing
Center Bearing . . . Rubber-Encased Ball Type

ELECTRICAL SYSTEM
Battery . . . 12-Volt, 78-Plate, 70 Amp-Hr
Alternator . . . 50 Amp., 750 Watts
Headlights . . . Dual Sealed-Beam, Foot-Switch Beam Control
Starter . . . High Torque, Ignition Key Starter Control
Parking Lights; Left Combination Stop and Taillight; Instrument Lights; Ignition Switch with Key Lock; Circuit Breakers; Rectifier

ENGINE
Standard . . . 226-hp 401 Super Duty V-8

FRAME
Side Rails—Type . . . Parallel, Channel Section—Tapered Front and Rear
Max. Section (Depth x Flange x Thick.)—in. . . . 9.5 x 3.0 x 0.25
Reinforcement . . . Channel, Inside Side Rail
Max. Section (Depth x Flange x Thick.)—in. . . . 9.0 x 2.56 x 0.15
Section Modulus . . . 14.93
Cross Members—Type . . . Flanged "U" Type with Alligator Jaw or Channel Type

FUEL TANK (All Tanks include Electric Fuel Pumps)
18-gallon . . . Frame-Mounted, Left Side
Optional . . . 125-gal. Saddle Tanks; 60-gal. Cylindrical Tank for Right and/or Left Side

SHOCK ABSORBERS (Front)
Standard—Type . . . Double-Acting, Telescopic

SPRINGS

	Front	Rear		
Semi-Elliptic, Ford Alloy Steel		Main	Auxiliary	
Length x Width—in.	57 x 3	56 x 3	37.5 x 3	
Number of Leaves	9	10	7	
Capacity at Spg. Pad (Norm. Defl.)—Per Spring	4000 lb.	7800 lb.	(combined)	
Optional Spring Capacity		8700 lb.	(combined)	

STEERING
Standard—Type . . . Worm and Dual Row Needle Bearing Roller
Wheel—Over-all Ratio . . . 20-in. Dia., 3-Spoke—24.4 to 1

Wheelbase	99"	111"	135"	153"
Turning Circle Dia., Right or Left—ft.	37.9	41.1	47.7	52.6

Optional—Type . . . Master-Guide Power Steering

TRANSMISSION
Standard . . . Spicer 4652 5-Speed Synchro-Silent Direct-In-Fifth
Optional . . . Spicer 4756C 5-Speed Synchro-Silent Direct-In-Fifth
Optional . . . Spicer 6352 5-Speed Synchro-Silent Direct-In-Fifth
Optional . . . Spicer 6852G 5-Speed Synchro-Silent Direct-In-Fifth
Optional . . . Spicer 6453A 5-Speed Synchro-Silent Overdrive
Optional . . . 8-Speed R-46 Roadranger (6.50 axle ratio and air brakes required)

Gear Positions	First	Second	Third	Fourth	Fifth	Reverse
Ratios (to 1):						
4652 5-Speed Direct	7.40	4.00*	2.47*	1.46*	1.00*	7.84
4756C 5-Speed Direct	6.50	3.52*	1.93*	1.17*	1.00*	6.88
6352 5-Speed Direct	7.31	4.09*	2.41*	1.44*	1.00*	7.33
6852G 5-Speed Direct	6.71	3.52*	1.97*	1.17*	1.00*	6.72
6453A 5-Speed Overdrive	6.07	3.40*	1.79*	1.00*	0.83*	6.09

R-46 8-Speed Roadranger . (9.78, 6.98, 4.99, 3.68, 2.66, 1.90, 1.36, 1.00, rev.11.01)
Power Take-Off Opening . . . SAE 6-Bolt, On Both Sides
*Synchronized Speeds.

WHEELS AND TIRES (Standard)
Wheels—Number—Type . . . Four—Cast Spoke
Rims—Number—Size . . . Seven—22.5 x 6.75
Tires—Number—Size . . . Six—10-22.5 10 PR

C-950 Specifications GVW 30,000 lb. • GCW 55,000 lb.

AXLE, FRONT
Standard Axle Capacity—lb. . . . 9,000
Optional Axle Capacity—lb. . . . 11,000
Includes 5,000-lb. front springs. Requires air brakes, power steering.
Optional Axle Capacity—lb. . . . 15,000
Includes 6,800-lb. front springs. Requires air brakes, power steering.

AXLE, REAR
Capacity—lb. . . . 21,000
Standard—Type . . . Single Reduction—Spiral Bevel—Full-Floating
Axle Ratios . . . 6.50 or 7.17 to 1
Optional—Type . . . Two-Speed Planet—Full-Floating
Ratios (to 1) . . . 6.50/8.87 or 7.17/9.77*
*7.17/9.77 ratio not recommended for tractor service.

BRAKES, SERVICE
Standard—Type . . . Vacuum-Power Operated, Hydraulic, Two-Shoe
Front: Double Anchor. Rear: Two-Cylinder, Self-Energizing
Front Brake (Drum Dia. x Lining Width—Thickness)—in. . . . 16 x 2¼—0.25
Rear Brake (Drum Dia. x Lining Width—Thickness)—in. . . . 16 x 6—0.50
Total Area (Lining)—sq. in. . . . 556.2
Booster (Effective Piston Dia.)—in. . . . 9½
Optional—Type (w/9,000- or 11,000-lb. front axles) Full-Air, Air Gauge on Instrument Panel, Air Windshield Wipers and Air Warning Buzzer
Front Brake (Drum Dia. x Lining Width—Thickness)—in. . . . 16¾ x 3½—0.44
Rear Brake (Drum Dia. x Lining Width—Thickness)—in. . . . 16½ x 6—0.75
Total Area (Lining)—sq. in. . . . 650.0
Compressor . . . 7¼ cu. ft. per min.
Air Reservoir Tanks . . . Two—1,150-cu. in. Cap'y each
Optional Compressor . . . 12 cu. ft. per min.
Optional Full Air Brakes (w/15,000 front axle)
Front Brake (Drum Dia. x Lining Width—Thickness)—in. . . . 17¼ x 3½—0.44
Rear Brake (Drum Dia. x Lining Width—Thickness)—in. . . . 16½ x 6—0.50
Total Area (Lining)—sq. in. . . . 664.6

BRAKE, HAND
Standard—Type . . Drum and Contracting Band at Rear of Transmission on Drive Line
Size (Drum Dia. x Lining Width, in.—Lining Area, sq. in.) . . . 10½ x 3—97.7
Optional—Type (with 6000 Series and R-46 Transmissions) . . . Internal Shoe
Size (Drum Dia. x Lining Width, in.—Lining Area, sq. in.) . . . 12 x 4—111.6

CLUTCH
Type . . . Hydraulically Operated, 13-in., Constant Pressure Two-Plate
Total Frictional Area—sq. in. . . . 378

COOLING SYSTEM
Type—Capacity—qt. . . . Three-Stage—51
Thermostats . . . Two, in Intake Manifold
Fan, Diameter—in. . . . 21—5-Blade

DRIVE LINE
Type . . . Hotchkiss, Straight-Line Drive
Propeller Shafts—Number, Type . . . (99" & 111" wb.) One, Tubular, Forged-Steel Ends (135" & 153" wb.) Two, Tubular, Forged-Steel Ends
Universal Joints—Number, Type . . . (99" & 111" wb.) Two, Needle Roller Bearing (135" & 153" wb.) Three, Needle Roller Bearing
Center Bearing . . . Rubber-Encased Ball Type

ELECTRICAL SYSTEM
Battery . . . 12-Volt, 78-Plate, 70 Amp-Hr
Alternator . . . 50 Amp., 750 Watts
Headlights . . . Dual Sealed-Beam, Foot-Switch Beam Control
Starter . . . High Torque, Ignition Key Starter Control
Parking Lights; Left Combination Stop and Taillight; Instrument Lights; Ignition Switch with Key Lock; Circuit Breakers; Rectifier

ENGINE
Standard . . . 226-hp 401 Super Duty V-8

FRAME
Side Rails—Type . . . Parallel, Channel Section—Tapered Front and Rear
Max. Section (Depth x Flange x Thick.)—in. . . . 9.75 x 3.50 x 0.28
Reinforcement . . . Channel, Inside Side Rail
Max. Section (Depth x Flange x Thick.)—in. . . . 9.20 x 3.03 x 0.25
Section Modulus . . . 21.75
Cross Members—Type . . . Flanged "U" Type with Alligator Jaw or Channel Type

FUEL TANK (All Tanks include Electric Fuel Pumps)
18-gallon . . . Frame-Mounted, Left Side
Optional . . . 125-gal. Saddle Tanks; 60-gal. Cylindrical Tank for Right and/or Left Side

SHOCK ABSORBERS (Front)
Standard—Type . . . Double-Acting, Telescopic

SPRINGS

	Front	Rear		
Semi-Elliptic, Ford Alloy Steel		Main	Auxiliary	
Length x Width—in.	57 x 3	56 x 3	37.5 x 3	
Number of Leaves	9	10	7	
Capacity at Spg. Pad (Norm. Defl.)—Per Spring	4000 lb.	9250 lb.	(combined)	
Optional Spring Capacity		10000 lb.	(combined)	

STEERING
Standard—Type . . . Worm and Dual Row Needle Bearing Roller
Wheel—Over-all Ratio . . . 20-in. Dia., 3-Spoke—24.4 to 1

Wheelbase	99"	111"	135"	153"
Turning Circle Dia., Right or Left—ft.	37.9	41.2	47.8	52.7

Optional—Type . . . Master-Guide Power Steering

TRANSMISSION
Standard . . . Spicer 4652 5-Speed Synchro-Silent Direct-In-Fifth
Optional . . . Spicer 4756C 5-Speed Synchro-Silent Direct-In-Fifth
Optional . . . Spicer 6352 5-Speed Synchro-Silent Direct-In-Fifth
Optional . . . Spicer 6852G 5-Speed Synchro-Silent Direct-In-Fifth
Optional . . . Spicer 6453A 5-Speed Synchro-Silent Overdrive
Optional . . . 8-Speed R-46 Roadranger (6.50 axle ratio and air brakes required)

Gear Positions	First	Second	Third	Fourth	Fifth	Reverse
Ratios (to 1):						
4652 5-Speed Direct	7.40	4.00*	2.47*	1.46*	1.00*	7.84
4756C 5-Speed Direct	6.50	3.52*	1.93*	1.17*	1.00*	6.88
6352 5-Speed Direct	7.31	4.09*	2.41*	1.44*	1.00*	7.33
6852G 5-Speed Direct	6.71	3.52*	1.97*	1.17*	1.00*	6.72
6453A 5-Speed Overdrive	6.07	3.40*	1.79*	1.00*	0.83*	6.09

R-46 8-Speed Roadranger . (9.78, 6.98, 4.99, 3.68, 2.66, 1.90, 1.36, 1.00, rev. 11.01)
Power Take-Off Opening . . . SAE 6-Bolt, On Both Sides
*Synchronized Speeds.

WHEELS AND TIRES (Standard)
Wheels—Number—Type . . . Four—Cast Spoke
Rims—Number—Size . . . Seven—22.5 x 7.5
Tires—Number—Size . . . Six—11-22.5 12 PR

C-1000 Specifications

GVW 31,000 lb. • GCW 55,000 lb. (Opt. GCW 65,000 lb.*)

**Requires 22,000-lb. rear axle*

AXLE, FRONT
- Standard Axle Capacity—lb. . . . 9,000
- Optional Axle Capacity—lb. . . . 11,000
  - Includes 5,000-lb. front springs. Requires power steering.
- Optional Axle Capacity—lb. . . . 15,000
  - Includes 6,800-lb. front springs. Requires power steering.

AXLE, REAR
- Capacity—lb. . . . 21,000
- Standard—Type . . . Single Reduction—Spiral Bevel—Full-Floating
  - Axle Ratios . . . 6.50 or 7.17 to 1
- Optional—Type . . . Two-Speed Planet—Full-Floating
  - Ratios (to 1) . . . 6.50/8.87
- Optional Capacity—lb. . . . 22,000
  - Type . . . Single Reduction—Spiral Bevel—Full-Floating
    - Axle Ratios . . . 6.17 or 6.67 to 1
  - Type . . . Two-Speed Planet—Full-Floating
    - Ratios (to 1) . . . 6.14/8.36 or 6.71/9.13

BRAKES, SERVICE
- Standard—Type . . . Full-Air, Heavy-Duty Two-Shoe with Slack Adjusters, Air Gauge on Instrument Panel, Air Windshield Wipers and Air Warning Buzzer
- Front Brake (Drum Dia. x Lining Width—Thickness)—in. . . . 16½ x 3½—0.44
- Rear Brake (Drum Dia. x Lining Width—Thickness)—in. . . . 16½ x 6—0.75
- Total Area (Lining)—sq. in. . . . 650.0
- Compressor . . . 7¾ cu. ft. per min.
- Air Reservoir Tanks . . . Two—1,150-cu. in. Cap'y each
- Optional Brakes (w/9,000- or 11,000-lb. Front and 22,000-lb. Rear Axles)
  - Total Area (Lining)—sq. in. . . . 718.2
- Optional Brakes (w/15,000-lb. Front and 21,000-lb. Rear Axles)
  - Total Area (Lining)—sq. in. . . . 664.6
- Optional Brakes (w/15,000-lb. Front and 22,000-lb. Rear Axles)
  - Total Area (Lining)—sq. in. . . . 732.8
- Optional Compressor . . . 12 cu. ft. per min.

BRAKE, HAND
- Type . . . Internal Shoe at Rear of Transmission on Drive Line
- Size (Drum Dia. x Lining Width, in.—Lining Area, sq. in.) . . . 12 x 4—111.6

CLUTCH
- Type . . . Hydraulically Operated, 13-in., Constant Pressure Two-Plate
- Total Frictional Area—sq. in. . . . 378

COOLING SYSTEM
- Type—Capacity—qt. . . . Three-Stage—51
- Thermostats . . . Two, in Intake Manifold
- Fan, Diameter—in. . . . 21—5-Blade

DRIVE LINE
- Type . . . Hotchkiss, Straight-Line Drive
- Propeller Shafts—Number, Type . . . (99" & 111" wb.) One, Tubular, Forged-Steel Ends (135" & 153" wb.) Two, Tubular, Forged-Steel Ends
- Universal Joints—Number, Type . . . (99" & 111" wb.) Two, Needle Roller Bearing (135" & 153" wb.) Three, Needle Roller Bearing
- Center Bearing . . . Rubber-Encased Ball Type

ELECTRICAL SYSTEM
- Battery . . . 12-Volt, 78-Plate, 70 Amp-Hr
- Alternator . . . 50 Amp., 750 Watts
- Headlights . . . Dual Sealed-Beam, Foot-Switch Beam Control
- Starter . . . High Torque, Ignition Key Starter Control
- Parking Lights; Left Combination Stop and Taillight; Instrument Lights; Ignition Switch with Key Lock; Circuit Breakers; Rectifier

ENGINE
- Standard . . . 260-hp 477 Super Duty V-8

FRAME
- Side Rails—Type . . . Parallel, Channel Section—Tapered Front and Rear
  - Max. Section (Depth x Flange x Thick.)—in. . . . 9.75 x 3.50 x 0.28
- Reinforcement . . . Channel, Inside Side Rail
  - Max. Section (Depth x Flange x Thick.)—in. . . . 9.20 x 3.03 x 0.25
- Section Modulus . . . 21.75
- Cross Members—Type . . . Flanged "U" Type with Alligator Jaw or Channel Type

FUEL TANK (All Tanks include Electric Fuel Pumps)
- 18-gallon . . . Frame-Mounted, Left Side
- Optional . . . 125-gal. Saddle Tanks; 60-gal. Cylindrical Tank for Right and/or Left Side

SHOCK ABSORBERS (Front)
- Standard—Type . . . Double-Acting, Telescopic

SPRINGS

	Front	Rear		
		Main	Auxiliary	
Semi-Elliptic, Ford Alloy Steel				
Length x Width—in.	57 x 3	56 x 3	37.5 x 3	
Number of Leaves	9	10	9	
Capacity at Spg. Pad (Norm. Defl.)—Per Spg.	4000 lb.	9650 lb.	(combined)	
Optional Spring Capacity		10400 lb.	(combined)	

STEERING
- Standard—Type . . . Worm and Dual Row Needle Bearing Roller
- Wheel—Over-all Ratio . . . 20-in. Dia., 3-Spoke—24.4 to 1

Wheelbase	99"	111"	135"	153"
Turning Circle Dia., Right or Left—ft.	37.7	41.0	47.6	52.5

- Optional—Type . . . Master-Guide Power Steering

TRANSMISSION
- Standard . . . Spicer 6352 5-Speed Synchro-Silent Direct-In-Fifth
- Optional . . . Spicer 6852G 5-Speed Synchro-Silent Direct-In-Fifth
- Optional . . . Spicer 6453A 5-Speed Synchro-Silent Overdrive
- Optional . . . 8-Speed R-46 Roadranger (6.17, 6.50 or 6.67 axle ratio required)

Gear Positions	First	Second	Third	Fourth	Fifth	Reverse
Ratios (to 1):						
6352 5-Speed Direct	7.31	4.09*	2.41*	1.44*	1.00*	7.33
6852G 5-Speed Direct	6.71	3.52*	1.97*	1.17*	1.00*	6.72
6453A 5-Speed Overdrive	6.07	3.40*	1.79*	1.00*	0.83*	6.09
R-46 8-Speed Roadranger	(9.78, 6.98, 4.99, 3.68, 2.66, 1.90, 1.36, 1.00, rev. 11.01)					

- Power Take-Off Opening . . . SAE 6-Bolt, On Both Sides

*Synchronized Speeds.

WHEELS AND TIRES (Standard)
- Wheels—Number—Type . . . Four—Cast Spoke
- Rims—Number—Size . . . Seven—22.5 x 7.5
- Tires—Number—Size . . . Six—11-22.5 12 PR

C-1100 Specifications

GVW 31,000 lb. • GCW 65,000 lb. (Opt. GVW 36,000 lb.*)

**Requires 11,000-lb. front axle, 29,000-lb. rear axle, HD rear main springs and special frame*

AXLE, FRONT
- Standard Axle Capacity—lb. . . . 9,000
- Optional Axle Capacity—lb. . . . 11,000
  - Includes 5,000-lb. front springs. Requires power steering.
- Optional Axle Capacity—lb. . . . 15,000
  - Includes 6,800-lb. front springs. Requires power steering.

AXLE, REAR
- Capacity—lb. . . . 22,000
- Standard—Type . . . Single Reduction—Spiral Bevel—Full-Floating
  - Axle Ratios . . . 6.17 or 6.67 to 1
- Optional—Type . . . Two-Speed Planet—Full-Floating
  - Ratios (to 1) . . . 6.14/8.36 or 6.71/9.13*
- Optional Capacity—lb. . . . 29,000**
  - Type . . . Double Reduction—Hypoid, Helical—Full-Floating
    - Axle Ratios . . . 7.03 to 1
  - Type . . . Two-Speed Double Reduction—Full-Floating
    - Ratios (to 1) . . . 6.42/8.38 or 7.09/9.07

*Not recommended for tractor service.
**With 6352 transmission only. Not available with 99" wb.

BRAKES, SERVICE
- Standard—Type . . . Full-Air, Heavy-Duty Two-Shoe with Slack Adjusters, Air Gauge on Instrument Panel, Air Windshield Wipers and Air Warning Buzzer
- Front Brake (Drum Dia. x Lining Width—Thick.)—in. . . . 16½ x 3½—0.44
- Rear Brake (Drum Dia. x Lining Width—Thick.)—in. . . . 16½ x 7—0.75
- Total Area (Lining)—sq. in. . . . 718.2
- Compressor . . . 7¾ cu. ft. per min
- Air Reservoir Tanks . . . Two—1,150-cu. in. Cap'y each
- Optional Brakes (w/15,000-lb. Front and 22,000-lb. or 29,000-lb. Rear Axles)
  - Total Area (Lining)—sq. in. . . . 732.8
- Optional Compressor . . . 12 cu. ft. per min.

BRAKE, HAND
- Type . . . Internal Shoe at Rear of Transmission on Drive Line
- Size (Drum Dia. x Lining Width, in.—Lining Area, sq. in.) . . . 12 x 4—111.6

CLUTCH
- Type . . . Hydraulically Operated, 13-in., Constant Pressure Two-Plate
- Total Frictional Area—sq. in. . . . 378

COOLING SYSTEM
- Type—Capacity—qt. . . . Three-Stage—52
- Thermostats . . . Two, in Intake Manifold
- Fan, Diameter—in. . . . 23—5-Blade

DRIVE LINE
- Type . . . Hotchkiss, Straight-Line Drive
- Propeller Shafts—Number, Type . . . (99" & 111" wb.) One, Tubular, Forged-Steel Ends (135" & 153" wb.) Two, Tubular, Forged-Steel Ends
- Universal Joints—Number, Type . . . (99" & 111" wb.) Two, Needle Roller Bearing (135" & 153" wb.) Three, Needle Roller Bearing
- Center Bearing . . . Rubber-Encased Ball Type

ELECTRICAL SYSTEM
- Battery . . . 12-Volt, 78-Plate, 70 Amp-Hr
- Alternator . . . 50 Amp., 750 Watts
- Headlights . . . Dual Sealed-Beam, Foot-Switch Beam Control
- Starter . . . High Torque, Ignition Key Starter Control
- Parking Lights; Left Combination Stop and Taillight; Instrument Lights; Ignition Switch with Key Lock; Circuit Breakers; Rectifier

ENGINE
- Standard . . . 277-hp Super Duty V-8

FRAME
- Side Rails—Type . . . Parallel, Channel Section—Tapered Front and Rear
  - Max. Section (Depth x Flange x Thick.)—in. . . . 9.75 x 3.50 x 0.28
- Reinforcement . . . Channel, Inside Side Rail
  - Max. Section (Depth x Flange x Thick.)—in. . . . 9.20 x 3.03 x 0.25
- Section Modulus . . . 21.75
- Cross Members—Type . . . Flanged "U" Type with Alligator Jaw or Channel Type

FUEL TANK (All Tanks include Electric Fuel Pumps)
- 18-gallon . . . Frame-Mounted, Left Side
- Optional . . . 125-gal. Saddle Tanks; 60-gal. Cylindrical Tank for Right and/or Left Side

SHOCK ABSORBERS (Front)
- Standard—Type . . . Double-Acting, Telescopic

SPRINGS

	Front	Rear		
		Main	Auxiliary	
Semi-Elliptic, Ford Alloy Steel				
Length x Width—in.	57 x 3	56 x 3	37.5 x 3	
Number of Leaves	9	10	9	
Capacity at Spg. Pad (Norm. Defl.)—Per Spg.	4000 lb.	9650 lb.	(combined)	
Optional Spring Capacity		10400 lb.	(combined)	

STEERING
- Standard—Type . . . Worm and Dual Row Needle Bearing Roller
- Wheel—Over-all Ratio . . . 20-in. Dia., 3-Spoke—24.4 to 1

Wheelbase	99"	111"	135"	153"
Turning Circle Dia., Right or Left—ft.	37.8	41.1	47.8	52.8

- Optional—Type . . . Master-Guide Power Steering

TRANSMISSION
- Standard . . . Spicer 6352 5-Speed Synchro-Silent Direct-In-Fifth
- Optional . . . Spicer 6852G 5-Speed Synchro-Silent Direct-In-Fifth
- Optional . . . Spicer 6453A 5-Speed Synchro-Silent Overdrive
- Optional . . . 8-Speed R-46 Roadranger (6.17 or 6.67 axle ratio required)

Gear Positions	First	Second	Third	Fourth	Fifth	Reverse
Ratios (to 1):						
6352 5-Speed Direct	7.31	4.09*	2.41*	1.44*	1.00*	7.33
6852G 5-Speed Direct	6.71	3.52*	1.97*	1.17*	1.00*	6.72
6453A 5-Speed Overdrive	6.07	3.40*	1.79*	1.00*	0.83*	6.09
R-46 8-Speed Roadranger	(9.78, 6.98, 4.99, 3.68, 2.66, 1.90, 1.36, 1.00, rev. 11.01)					

- Power Take-Off Opening . . . SAE 6-Bolt, On Both Sides

*Synchronized Speeds.

WHEELS AND TIRES (Standard)
- Wheels—Number—Type . . . Four—Cast Spoke
- Rims—Number—Size . . . Seven—22.5 x 7.5
- Tires—Number—Size . . . Six—11-22.5 12 PR

T-SERIES POWER TRAIN SELECTIONS
Engine—Transmission—Axle Ratio (to 1) Combinations

T-850

Transmission	401 SD V-8		477 SD V-8	534 SD V-8
	28,000-lb. axle	34,000-lb. axle	34,000-lb. axle	34,000-lb. axle
4652 w/o Aux.	7.07 or 7.79	7.80 or 8.60	—	—
4652 w/7231B	7.07 or 7.79	7.80 or 8.60	—	—
4652 w/7231D	7.07 or 7.79	7.80 or 8.60	—	—
6352 w/o Aux.	7.07 or 7.79	7.80 or 8.60	6.69 or 7.80	5.85, 6.69 or 7.80
6352 w/7231B	7.07 or 7.79	7.80 or 8.60	6.69 or 7.80	5.85, 6.69 or 7.80
6352 w/7231D	7.07 or 7.79	7.80 or 8.60	6.69 or 7.80	—
R-46	7.07 or 7.79	6.69 or 7.80	5.85, 6.69 or 7.80	5.85, 6.69 or 7.80

T-950

Transmission	401 SD V-8	477 SD V-8	534 SD V-8
	38,000-lb. axle	38,000-lb. axle	38,000-lb. axle
4652 w/o Aux.	7.60 or 8.38	—	—
4652 w/7231B	7.60 or 8.38	—	—
4652 w/7231D	7.60 or 8.38	—	—
6352 w/o Aux.	7.60 or 8.38	6.50, 7.60 or 8.38	5.57, 6.50, 7.60 or 8.38
6352 w/7231B	7.60 or 8.38	6.50, 7.60 or 8.38	5.57, 6.50, 7.60 or 8.38
6352 w/7231D	7.60 or 8.38	6.50, 7.60 or 8.38	6.50, 7.60 or 8.38
R-46	7.60	6.50 or 7.60	5.57 or 6.50

T-850 Specifications

GVW 43,000 lb. • GCW 70,000 lb. (Opt. GVW 37,000* or 45,000† lb.)—(Opt. GCW 55,000 lb.*)

Requires 28,000-lb. rear axle, 9,000-lb. front axle and 401 SD V-8
†Requires 34,000-lb. rear axle, 11,000-lb., or 15,000-lb. front axle, air brakes and maximum size wheels and tires

AXLE, FRONT
Standard Axle Capacity—lb. . . . 9,000
Optional Axle Capacity—lb. . . . 11,000*
Includes 5,000-lb. front springs.
Optional Axle Capacity—lb. . . . 15,000*
Includes 6,800-lb. front springs. *w/45,000-lb. GVW package only.

AXLE, REAR
Capacity—lb. . . . 34,000
Type . . . Single Reduction—Spiral Bevel—Full-Floating
Axle Ratios . . . (w/401 V-8) 6.69,* 7.80 or 8.60 to 1
Optional Ratios . . . (w/477 V-8) 5.85,* 6.69** or 7.80 to 1
(w/534 V-8) 5.85,** 6.69** or 7.80 to 1
*Available only with R-46 transmission and air brakes.
**Available only with air brakes.
Optional Capacity—lb. . . . 28,000
Axle Ratios . . . (w/401 V-8) 7.07 or 7.79 to 1
(includes 9-22.5 10 PR tires on 6.75 rims)

BRAKES, SERVICE
Standard—Type . . . Vacuum-Power Operated, Hydraulic, Two-Shoe
Front Brake (Drum Dia. x Lining Width—Thick.)—in. . . . 16 x 2¼—0.25
Rear Brake (Drum Dia. x Lining Width—Thick.)—in. . . . 16 x 5—0.50
Total Area (Lining)—sq. in. . . . 807.6
Booster (Effective Dia.)—in. . . . 9.5
Optional Vacuum-Hydraulic Brakes (w/28,000-lb. Rear Axle)
Total Area (Lining)—sq. in. . . . 765.6
Optional—Type . . . Full-Air, Heavy-Duty Two-Shoe with Slack Adjusters: Air Gauge on Instrument Panel, Air Windshield Wipers and Air Warning Buzzer
Compressor . . . 7¼ cu. ft. per min.
Air Reserve Tanks . . . Three—830-cu. in. Cap'y each
Optional Full-Air Brakes (w/9,000-lb. front and 28,000-lb. rear)
Total Area (Lining)—sq. in. . . . 767.7
Optional—Full-Air Brakes (w/9,000- or 11,000-lb. front & 34,000-lb. rear)
Total Area (Lining)—sq. in. . . . 904.7
Optional Full-Air Brakes (w/15,000-lb. front and 34,000-lb. rear axles)
Total Area (Lining)—sq. in. . . . 1006.8
Optional Compressor . . . 12 cu. ft. per min.

BRAKE, HAND
Standard—Type . . . Drum and Contracting Band at Rear of Transmission on Drive Line
Size (Drum Dia. x Lining Width, in.—Lining Area, sq. in.) . . . 11½ x 4—142.7
Optional Type (with R-46, 6,000 and 7,000 Series Transmissions) . . . Internal Shoe
Size (Drum Dia. x Lining Width, in.—Lining Area, sq. in.) . . . 12 x 4—111.6

CLUTCH
Type . . . Hydraulically Operated, 13-in., Constant Pressure Two-Plate
Total Frictional Area—sq. in. . . . 378

COOLING SYSTEM
Type—Capacity—qt. . . . Three-Stage—46 (47 with 534 SD V-8)
Thermostats . . . Two, in Intake Manifold
Fan, Diameter—in. . . . 21 (23 with 534 SD V-8)—5-Blade

DRIVE LINE
Type . . . Hotchkiss, Straight-Line Drive
Propeller Shafts—Number . . . Two, Tubular, Forged-Steel Ends
Universal Joints—Number, Type . . . Three, Needle Roller Bearing
Center Bearing . . . Rubber-Encased Ball Type

ELECTRICAL SYSTEM
Battery . . . 12-Volt, 78-Plate, 70 Amp-Hr
Alternator . . . 50 Amp., 750 Watts
Headlights . . . Dual Sealed-Beam, Foot-Switch Beam Control
Starter . . . High Torque, Ignition Key Starter Control
Parking Lights; Left Combination Stop and Taillight; Instrument Lights; Ignition Switch with Key Lock; Circuit Breakers; Rectifier

ENGINE
Standard . . . 226-hp 401 Super Duty V-8
Optional . . . 260-hp 477 Super Duty V-8†
Optional . . . 277-hp 534 Super Duty V-8†
†Optional main transmission required.

FRAME
Side Rails—Type . . . Parallel, Channel Section—Tapered Front, Full-Depth Rear
Max. Section (Depth x Flange x Thick.)—in. . . . 9.75 x 3.50 x 0.375
Reinforcement . . . Channel, Inside Side Rail
Max. Section (Depth x Flange x Thick.)—in. . . . 9.00 x 3.125 x 0.15
Section Modulus . . . 22.06
Cross Members—Type . . . Flanged "U" Type with Alligator Jaw or Channel Type

FUEL TANK (All Tanks include Electric Fuel Pumps)
18-gallon . . . Frame-Mounted, Left Side
Optional . . . 125-gal. Saddle Tanks (except 144" wb.); 100-gal. Step Tanks, with air brakes only; 60-gal. Cylindrical Tank for Right and/or Left Side. (Cylindrical not avail. on 144" and 156" wb.)

SPRINGS

	Front	Rear
Semi-Elliptic, Ford Alloy Steel		
Length x Width—in.	52 x 3	34 x 4
Number of Leaves	8	12
Capacity at Spg. Pad (Norm. Defl.)—Per Spg.	4000 lb.	15500 lb.

STEERING
Standard—Type . . . Master-Guide Power Steering
Wheel—Over-all Ratio . . . 20-in. Dia., 3-Spoke—24.4 to 1

Wheelbase	144"	156"	175"	192"
Turning Circle Dia., Right or Left—ft.	49.4	52.7	58.0	62.6

TRANSMISSION

Gear Positions	First	Second	Third	Fourth	Fifth	Reverse
Ratios (to 1):						
Standard 4652 5-Speed Direct. . . .	7.40	4.00*	2.47*	1.46*	1.00*	7.84
Optional 6352 5-Speed Direct. . . .	7.31	4.09*	2.41*	1.44*	1.00*	7.33

Optional R-46 8-Speed Roadranger . . . (9.78, 6.98, 4.99, 3.68, 2.66, 1.90, 1.36, 1.00, rev. 11.01) (Axle ratios required: 5.85, 6.69, 7.80, 7.79 or 7.07. Not available with auxiliary transmission.)
Power Take-Off Opening . . . SAE 6-Bolt, On Both Sides
*Synchronized Speeds.

TRANSMISSION, AUXILIARY (except 144" wb.)

Gear Positions	Overdrive	Underdrive	Direct
Ratios (to 1):			
Optional Spicer 7231B 3-Speed . . .	0.86	1.24	1.00
Optional Spicer 7231D* 3-Speed . . .	0.86	2.14	1.00

*Not available with 534 SD V-8.

WHEELS AND TIRES (Standard)
Wheels—Number—Type . . . Six—Cast Spoke
Rims—Number—Size . . . Eleven—22.5 x 6.75
Tires—Number—Size . . . Ten—10-22.5 10 PR

T-950 Specifications

GVW 46,000 lb. • GCW 75,000 lb. (Opt. GVW 48,000* or 51,000† lb.)

Requires 11,000-lb. front axle
†Requires 15,000-lb. front axle

AXLE, FRONT
Standard Axle Capacity—lb. . . . 9,000
Optional Axle Capacity—lb. . . . 11,000
Includes 5,000-lb. front springs.
Optional Axle Capacity—lb. . . . 15,000
Includes 6,800-lb. front springs.

AXLE, REAR
Capacity—lb. . . . 38,000
Type . . . Single Speed—Spiral Bevel—Full-Floating
Axle Ratios . . . (w/401 V-8) 7.60 or 8.38 to 1
Optional Ratios . . . (w/477 V-8) 6.50, 7.60 or 8.38 to 1
(w/534 V-8) 5.57,* 6.50, 7.60 or 8.38 to 1
*Not used in combination w/7231D auxiliary transmission.

BRAKES, SERVICE
Standard—Type . . . Full-Air, Heavy-Duty Two-Shoe with Slack Adjusters: Air Gauge on Instrument Panel, Air Windshield Wipers and Air Warning Buzzer
Front Brake (Drum Dia. x Lining Width—Thick.)—in. . . . 16½ x 3½—0.312
Rear Brake (Drum Dia. x Lining Width—Thick.)—in. . . . 16½ x 6—0.75
Total Area (Lining)—sq. in. . . . 1061.8
Compressor . . . 7¼ cu. ft. per min.
Air Reservoir Tanks . . . One—1275-cu. in.; Two—1395-cu. in. Cap'y each
Optional Compressor . . . 12 cu. ft. per min.
Optional Brakes—(w/15,000-lb. Front and 38,000-lb. Rear Axles)
Total Area (Lining)—sq. in. . . . 1076.4

BRAKE, HAND
Standard—Type . . . Drum and Contracting Band at Rear of Transmission on Drive Line
Size (Drum Dia. x Lining Width, in.—Lining Area, sq. in.) . . . 11½ x 4—142.7
Optional—Type (with R-46, 6,000 and 7,000 Series Transmissions) . . . Internal Shoe
Size (Drum Dia. x Lining Width, in.—Lining Area, sq. in.) . . . 12 x 4—111.6

CLUTCH
Type . . . Hydraulically Operated, 13-in., Constant Pressure Two-Plate
Total Frictional Area—sq. in. . . . 378

COOLING SYSTEM
Type—Capacity—qt. . . . Three-Stage—46 (47 with 534 SD V-8)
Thermostats . . . Two, in Intake Manifold
Fan, Diameter—in. . . . 21 (23 with 534 SD V-8)—5-Blade

DRIVE LINE
Type . . . Hotchkiss, Straight-Line Drive
Propeller Shafts—Number . . . Two, Tubular, Forged-Steel Ends
Universal Joints—Number, Type . . . Three, Needle Roller Bearing
Center Bearing . . . Rubber-Encased Ball Type

ELECTRICAL SYSTEM
Battery . . . 12-Volt, 78-Plate, 70 Amp-Hr
Alternator . . . 50 Amp., 750 Watts
Headlights . . . Dual Sealed-Beam, Foot-Switch Beam Control
Starter . . . High Torque, Ignition Key Starter Control
Parking Lights; Left Combination Stop and Taillight; Instrument Lights; Ignition Switch with Key Lock; Circuit Breakers; Rectifier

ENGINE
Standard . . . 226-hp 401 Super Duty V-8
Optional . . . 260-hp 477 Super Duty V-8‡
Optional . . . 277-hp 534 Super Duty V-8‡
‡Optional main transmission required.

FRAME
Side Rails—Type . . . Parallel, Channel Section—Tapered Front, Full-Depth Rear
Max. Section (Depth x Flange x Thick.)—in. . . . 9.95 x 3.50 x 0.375
Reinforcement . . . Channel, Inside Side Rail
Max. Section (Depth x Flange x Thick.)—in. . . . 9.20 x 3.125 x 0.25
Section Modulus . . . 25.65
Cross Members—Type . . . Flanged "U" Type with Alligator Jaw or Channel Type

FUEL TANK (All Tanks include Electric Fuel Pumps)
18-gallon . . . Frame-Mounted, Left Side
Optional . . . 125-gal. Saddle Tanks; 100-gal. Step Tanks; 60-gal. Cylindrical Tank for Right and/or Left Side. (Cylindrical not avail. on 156" wb.)

SPRINGS

	Front	Rear
Semi-Elliptic, Ford Alloy Steel		
Length x Width—in.	52 x 3	34 x 4
Number of Leaves	8	12
Capacity at Spg. Pad (Norm. Defl.)—Per Spg.	4000 lb.	15500 lb.

STEERING
Standard—Type . . . Master-Guide Power Steering
Wheel—Over-all Ratio . . . 20-in. Dia., 3-Spoke—24.4 to 1

Wheelbase	156"	175"	192"
Turning Circle Dia., Right or Left—ft.	52.7	57.9	62.6

TRANSMISSION

Gear Positions	First	Second	Third	Fourth	Fifth	Reverse
Ratios (to 1):						
Standard 4652 5-Speed Direct. . . .	7.40	4.00*	2.47*	1.46*	1.00*	7.84
Optional 6352 5-Speed Direct. . . .	7.31	4.09*	2.41*	1.44*	1.00*	7.33

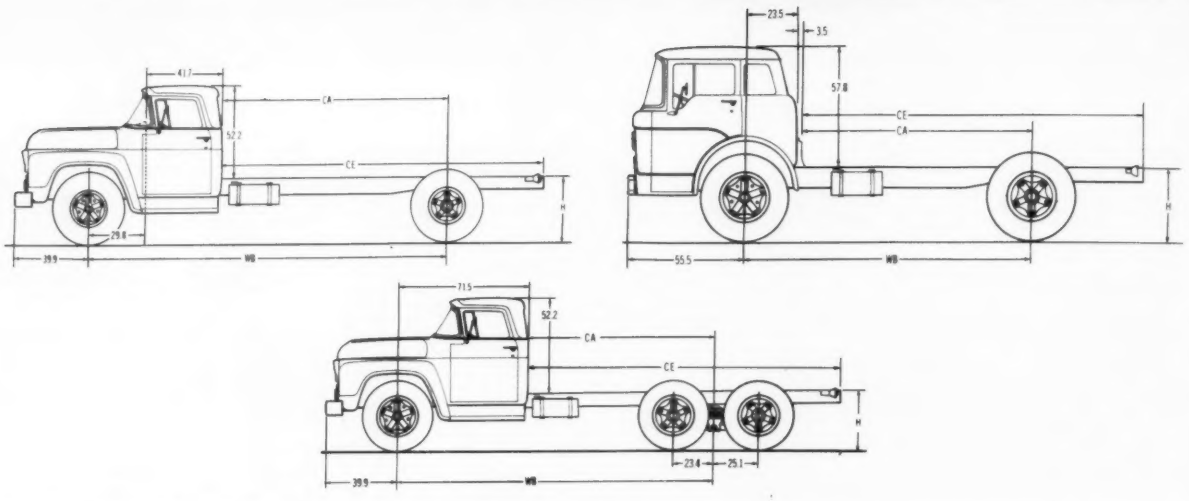
Optional R-46 8-Speed Roadranger . . . (9.78, 6.98, 4.99, 3.68, 2.66, 1.90, 1.36, 1.00, rev. 11.01) (Axle ratios required: 7.60 w/401 V-8, 6.50 or 7.60 w/477 V-8 and 5.57 or 6.50 w/534 V-8. Not available with auxiliary transmission.)
Power Take-Off Opening . . . SAE 6-Bolt, On Both Sides
*Synchronized Speeds.

TRANSMISSION, AUXILIARY

Gear Positions	Overdrive	Underdrive	Direct
Ratios (to 1):			
Optional Spicer 7231B 3-Speed . . .	0.86	1.24	1.00
Optional Spicer 7231D* 3-Speed . . .	0.86	2.14	1.00

*Not available in combination with 534 SD V-8 and 5.57 axle ratio.

WHEELS AND TIRES (Standard)
Wheels—Number—Type . . . Six—Cast Spoke
Rims—Number—Size . . . Eleven—22.5 x 7.5
Tires—Number—Size . . . Ten—11-22.5 12 PR



DIMENSIONS AND CHASSIS WEIGHTS

MODEL	WB (in.)	CA (in.)	CE (in.)	Nom. Body Lengths (ft.)	Curb Weights* (lb.) Front	Rear	Total
					10-22.5 10 PR Tires		
	132	60.5	111.7	7½-9	3995	2930	6925
F-850	144	72.5	123.7	9-11	4010	2950	6960
GVW 25,000 lb.	156	84.5	135.7	10-13	4035	3000	7035
	175	103.5	163.5	13-16	4065	3065	7130
	192	120.5	180.5	15-19	4175	3035	7210
					11-22.5 12 PR Tires		
F-950	132	60.5	111.7	7½-9	4285	3255	7540
GVW 29,000 lb.	144	72.5	123.7	9-11	4320	3285	7605
	156	84.5	135.7	10-13	4365	3335	7700
	175	103.5	163.5	13-16	4420	3390	7810
	192	120.5	180.5	15-19	4460	3425	7885
					11-22.5 12 PR Tires		
F-1000	132	60.5	111.7	7½-9	4340	3530	7870
GVW 30,000 lb.	144	72.5	123.7	9-11	4375	3565	7940
	156	84.5	135.7	10-13	4420	3610	8030
	175	103.5	163.5	13-16	4475	3665	8140
	192	120.5	180.5	15-19	4510	3700	8210
					11-22.5 12 PR Tires		
F-1100	132	60.5	111.7	7½-9	4345	3700	8045
GVW 30,000 lb.	144	72.5	123.7	9-11	4380	3735	8115
OPT. GVW 36,000 lb.	156	84.5	135.7	10-13	4425	3780	8205
	175	103.5	163.5	13-16	4480	3835	8315
	192	120.5	180.5	15-19	4520	3875	8395
					10-22.5 10 PR Tires		
C-850	99	72	123.2	9-11	5030	2335	7365
GVW 26,000 lb.	111	84	135.2	10-13	5040	2355	7395
	135	108	168.0	13-16	5135	2410	7545
	153	126	186.0	16-20	5175	2450	7625
					11-22.5 12 PR Tires		
C-950	99	72	123.2	9-11	5205	2775	7980
GVW 30,000 lb.	111	84	135.2	10-13	5225	2805	8030
	135	108	168.0	13-16	5320	2880	8200
	153	126	186.0	16-20	5375	2935	8310
					11-22.5 12 PR Tires		
C-1000	99	72	123.2	9-11	5465	3025	8490
GVW 31,000 lb.	111	84	135.2	10-13	5495	3050	8545
	135	108	168.0	13-16	5560	3095	8655
	153	126	186.0	16-20	5610	3125	8735
					11-22.5 12 PR Tires		
C-1100	99	72	123.2	9-11	5465	3195	8660
GVW 31,000 lb.	111	84	135.2	10-13	5495	3220	8715
OPT. GVW 36,000 lb.	135	108	168.0	13-16	5560	3265	8825
	153	126	186.0	16-20	5610	3295	8905
					10-22.5 10 PR Tires		
T-850	144	72.5	128.5	10-11	4100	6020	10120
GVW 43,000 lb.	156	84.5	144.5	11-13	4140	6055	10195
OPT. GVW 45,000 lb.	175	103.5	175.5	13-16	4210	6105	10315
OPT. GVW 37,000 lb.	192	120.5	204.5	15-19	4275	6155	10430
					11-22.5 12 PR Tires		
T-950							
GVW 46,000 lb.	156	84.5	144.5	11-13	4670	6735	11405
OPT. GVW 48,000 lb.	175	103.5	175.5	13-16	4795	6860	11655
OPT. GVW 51,000 lb.	192	120.5	204.5	15-19	4840	6905	11745

FRAME HEIGHT AT REAR AXLE

SERIES	TIRE SIZE	H (in.) Empty	Loaded
F-850	10-22.5 10 PR	36.0	33.0
	11-22.5 12 PR	36.6	33.6
F-950 thru F-1100	11-22.5 12 PR	36.2	33.7
	11-24.5 12 PR	37.2	34.7
	12-22.5 12 or 14 PR	36.9	34.4
	12-24.5 12 PR	37.9	35.4
C-850	10-22.5 10 PR	35.1	32.9
	11-22.5 12 PR	35.7	33.5
C-950 thru C-1100	11-22.5 12 PR	36.1	33.7
	11-24.5 12 PR	37.1	34.7
	12-22.5 12 or 14 PR	36.8	34.4
	12-24.5 12 PR	37.8	35.4
T-850	10-22.5 10 PR	38.7	37.7
	11-22.5 12 PR	39.3	38.3
T-950	11-22.5 12 PR	40.3	39.3
	11-24.5 12 PR	41.3	39.3
	12-22.5 12 or 14 PR	41.0	40.0
	12-24.5 12 PR	42.0	41.0

OPTIONAL EQUIPMENT ADD WEIGHTS

	Front	Rear	Total
Axle, Front—11,000 lb.			
F-850	110	0	110
F-950, F-1000, F-1100, T-850, T-950	90	0	90
C-850, C-950	115	0	115
C-1000	80	0	80
C-1100	105	0	105
Axle, Front—15,000 lb.			
F-1000, F-1100	280	0	280
C-950	250	0	250
C-1000	330	0	330
C-1100	360	0	360
T-850, T-950	380	0	380
Axle, Rear—Single-Speed			
F-C-1000—22,000 lb.	0	90	90
F-C-1100—29,000 lb.	0	225	225
Axle, Rear—Two-Speed			
F-C-850—18,000 lb.	0	125	125
F-C-950, F-C-1000—21,000 lb.	0	25	25
F-C-1000—22,000 lb.	0	150	150
F-C-1100—29,000 lb.	0	325	325
Axle, Rear—Tandem			
T-850—28,000 lb.	0	345†	345†
Brakes, Full Air			
F-850, C-850	95	205	300
F-950, C-950	90	165	255
T-850	120	405	525
Power Steering (F- & C-Series)	100	0	100
Transmission—8000 Series			
F-850, F-950	110	35	145
T-850	65	20	85
T-950	95	30	125
Transmission—Roadranger			
F-850, F-950	195	40	235
F-1000, F-1100	75	15	90
C-850, C-950	185	100	285
C-1000, C-1100	60	25	85
T-850 (over 4000 Series)	195	35	230
T-950 (over 4000 Series)	170	40	210
Tires, Tubeless			
F-C-850 11-22.5 12 PR (7.5)	66	140	206
F-C-950 thru 1100 11-24.5 12 PR (8.25)	58	134	192
12-22.5 12 PR (8.25)	46	103	149
12-24.5 12 PR (8.25)	76	170	246
12-22.5 14 PR (8.25)	68	147	215
T-850 11-22.5 12 PR (7.5)	66	273	339
T-950 11-24.5 12 PR (8.25)	58	250	308
12-22.5 12 PR (8.25)	46	195	241
12-24.5 12 PR (8.25)	76	322	398
12-22.5 14 PR (8.25)	68	272	340

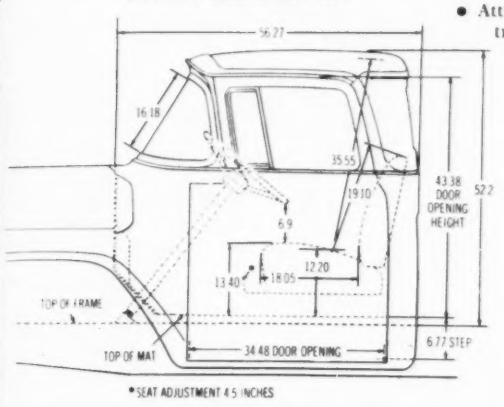
*All weights are estimated. Curb weights include standard cab and equipment, full tank of fuel, oil and lubricants. For Chassis-Cowl deduct 395 lb. "Front," 175 lb. "Rear" and 570 lb. "Total." †Deduct.

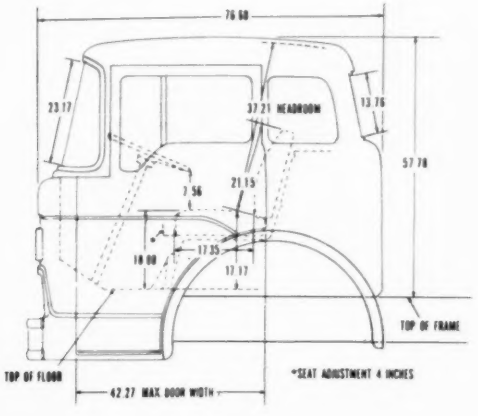
FORD Driverized Cabs

GREATEST CAB LUXURY AND VALUE—FORD'S CUSTOM CAB—

Conventional and Tilt (shown above) Add to Ford's standard cab features all these custom "extras," and you'll see why the Custom Cab is worth its small additional cost!

- Two-tone woven nylon-saran brown and white hound's-tooth pattern seat upholstery
- Foam-rubber padding in seat cushion
- Foam-rubber padding in seat back (driver's section, Tilt Cab)
- Thermacoustic headlining backed by one-half inch of glass wool insulation
- Sound deadener on floor and rear cab panel
- Insulation on cowl wall in cab (Conventional Cab)
- Attractive hardboard door and cowl-side trim panels (Conventional Cab)
- Arm rest on left door (Conventional Cab)
- Fold-down arm rest on driver's side (Tilt Cab)
- Large dome light with manual switch
- Sun visor on right side
- Illuminated cigar-cigarette lighter
- Bright-metal grille and hooded headlight assembly (Conventional Cab)
- Bright-metal windshield reveal molding
- Bright-metal parking light rims (Standard Tilt Cab)
- "Custom Cab" emblem on each door
- Matched locks on both doors





STANDARD CAB EQUIPMENT

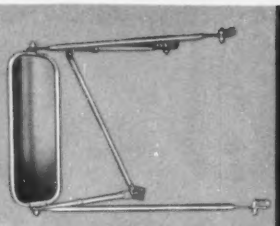
(In addition to items listed on specification pages)

- Air Wing Ventilators in Doors
- Ammeter
- Ash Receptacle
- Cab All-Weather Ventilation (C-Series)
- Channel Front Bumper
- Choke Control
- Differential Lockout Control with Warning Light (T-Series)
- Dispatch Box
- Door Lock, Right Side
- Fuel Gauge
- Full-Wrap Windshield
- Hand Throttle
- Hi-Dri Cowl Ventilator (F- and T-Series)
- Horns, Twin Electric
- Inboard Cab Step
- Instrument Panel
- Light Switch
- Mirror, Rearview, Outside Left
- Oil Pressure Gauge
- Running Boards (F- and T-Series)
- Speedometer
- Sun Visor, Left Side
- Tachometer
- Tools
- Water Temperature Gauge
- Windshield Wipers, Dual Electric —Air on Air-Equipped Chassis

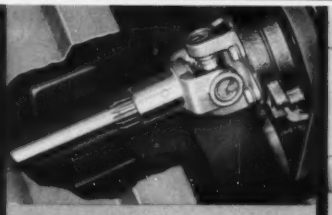
STANDARD COLORS

Choice of Vermilion, Midnight Blue, Azure Blue, Gunmetal Gray, Raven Black, Colonial White, Meadow Green, Seaspray Green, Goldenrod Yellow or Prime (F- and T-Series: on hood, fenders, cowl, cab, interior metal, inboard cab step, running boards and fuel filler cap. Any of the above colors can be combined with Colonial White for a smart Two Tone effect on the cab). (C-Series: on cab, interior metal, and inboard cab step.) Painted Raven Black are frame, door vent frame and glass channel, fuel tank, taillight, springs, axles, and wheels. Painted Colonial White are bumper, grille, dual headlight assembly, parking light rims and outside rearview mirror. Headlights and parking light rims are bright-metal on C-Series.

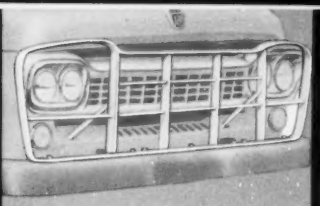
CONSTRUCTED IN THE DRY



Full-view mirror (Western type) has a large 6 x 16 inch reflecting surface for maximum side and rear visibility. Adjustable arms and mirror.



Front-end power take-off for front-mounted pump, etc. Power take-off unit consisting of damper assembly and jack shaft available on Ford F- and T-Series.



Heavy-duty grille guard is braced to truck frame for grille, radiator and headlight protection. Rugged bar steel construction. Tow hooks also available.

Full-wrap rear window provides wide-angle visibility. Over 766 sq. in. available on F- & T-Series for Standard or Custom Cabs. Bright-metal molding around window.

FORD Accessories and Optional Equipment in addition to those previously shown:

REGULAR PRODUCTION OPTIONS

Air Horns, on air equipped models
Arm Rest, Left (Standard Cab)
Cab, Custom
Carrier, Spare Wheel
Heater and Defroster, MagicAire or Recirculating
Hydraulic Jack, 5-ton (F- & C-850), 8-ton (F- & C-950, 1000 & 1100; T-850 & 950)
Padded Instrument Panel and Cushioned Visors
Radio
Spare Tire, Tubeless
Sun Visor, right side (Standard Cab)
Tinted Glass
Tube-Type Tires
Turn Signals, Front & Rear
Windshield Washers
Wheels & Tires (Tubeless)

F- & C-850

(7) 22.5 x 7.5 Rims
(7) 22.5 x 7.5 Disc Wheels, 8-hole or 10-hole type
(6) 11-22.5 12 PR Tires*

**Heavy Duty rear springs and 7.5 rims or wheels required.*

F- & C-950, 1000 & 1100

(7) 22.5 x 8.25 Rims
(7) 24.5 x 8.25 Rims
(7) 22.5 x 7.5 Disc Wheels, 10-hole
(7) 22.5 x 8.25 Disc Wheels, 10-hole
(7) 24.5 x 8.25 Disc Wheels, 10-hole
(6) 11-24.5 12 PR Tires*
(6) 12-22.5 12 PR Tires*
(6) 12-24.5 12 PR Tires*
(6) 12-22.5 14 PR Tires*

**Heavy Duty rear springs and 8.25 rims or wheels required.*

T-850

(11) 22.5 x 7.5* Rims
(11) 22.5 x 6.75** Disc Wheels, 8-hole
(11) 22.5 x 7.5* Disc Wheels, 8-hole
(11) 22.5 x 7.5† Disc Wheels, 10-hole
(10) 10-22.5 10 PR Tires**
(10) 11-22.5 12 PR Tires*‡

**For highway operation only if used with 28,000-lb. axle.*
***With 28,000-lb. axle only.*
†With 34,000-lb. axle only.
‡22.5 x 7.5 rims or disc wheels required.

T-950

(11) 22.5 x 8.25 Rims
(11) 24.5 x 8.25 Rims
(11) 22.5 x 7.5 Disc Wheels, 10-hole
(11) 22.5 x 8.25 Disc Wheels, 10-hole
(11) 24.5 x 8.25 Disc Wheels, 10-hole
(10) 11-24.5 12 PR Tires*
(10) 12-22.5 12 PR Tires*
(10) 12-24.5 12 PR Tires*
(10) 12-22.5 14 PR Tires*

**8.25 rims or wheels required.*

PRE-APPROVED OPTIONS

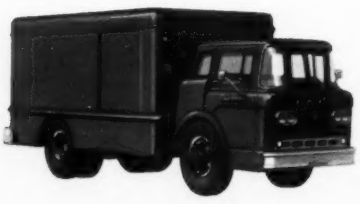
Arm Rest, Right Side for All Cabs
Cigar Lighter (Standard Cab)
Dome Light (Standard Cab)
Generator, Ford, 40 amp., 600 watts
Generator, 50 amp., 750 watt (T-850, T-950)
ICC Clearance Lights
Mirrors: Inside Safety;
Outside—Right, Non-Telescopic;
Left or Right, Telescopic (except C-Series)
Shock Absorbers, front (Std. on C-Series)
Spare Tire, Tube-type
Taillight, Right
Turn Signals, front only
Vacuum Reserve Tank, 1,000 cu. in. (F- & C-850, 950)

ACCESSORIES—DEALER INSTALLED

Fire Extinguisher
Locking Gas Tank Cap
Reflector Flares (3 in Kit) with Flags
Seat Belts
Seat Covers
Seat Cushion, Ventilated
Shaver, Electric
Splash Guards

Comparative information in this folder was obtained from authoritative sources, but is not guaranteed. The specifications contained herein were in effect at the time this folder was approved for printing. The Ford Division of Ford Motor Company reserves the right to discontinue models at any time, or change specifications or design, without notice and without incurring obligation. All options and accessories illustrated or referred to as optional or available in this folder are at extra cost. For the price of the model with the equipment you desire, see your Ford Dealer.

FORD Division of FORD MOTOR COMPANY • DEARBORN, MICHIGAN



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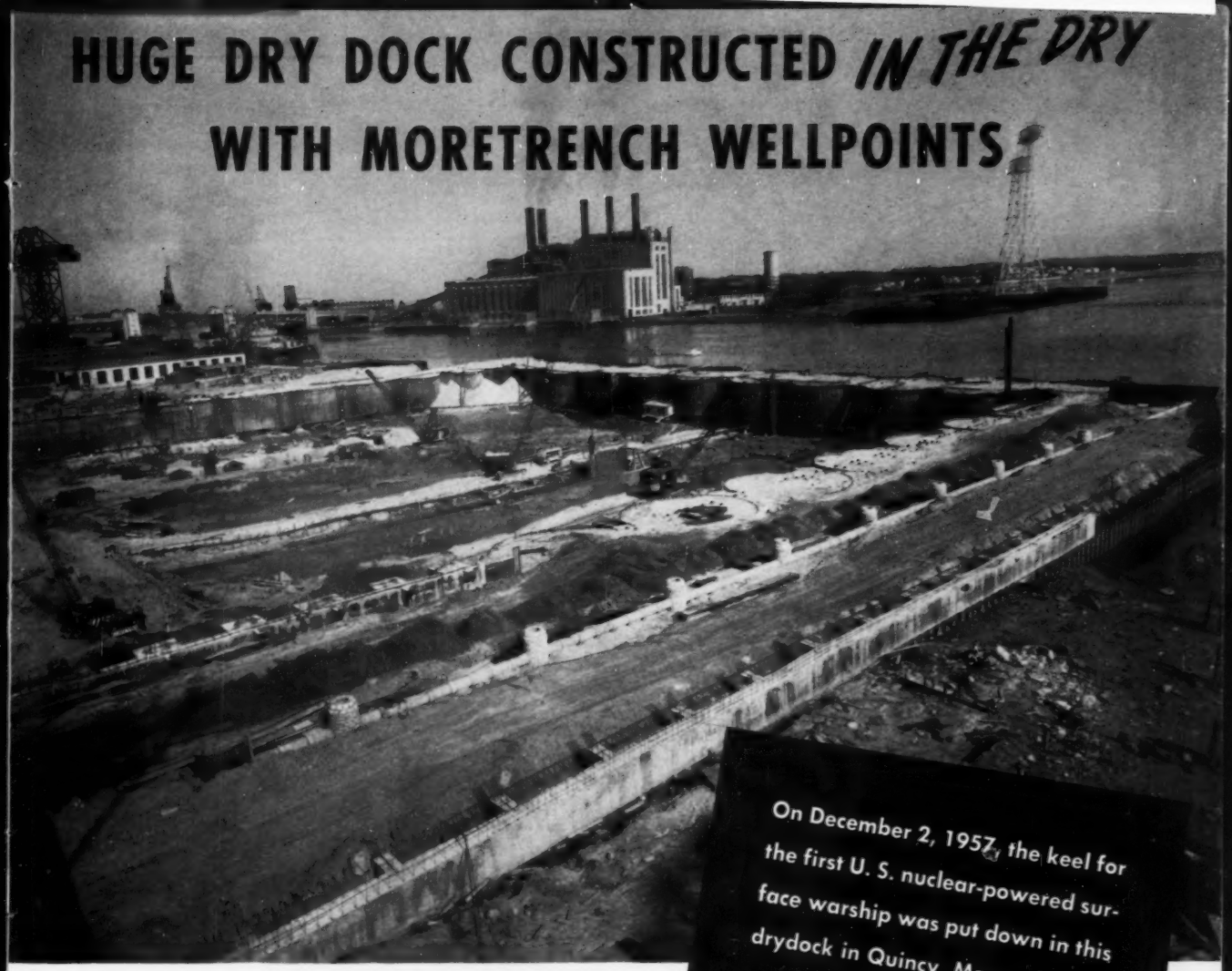
Form No. T-3158

HUGE DRY DOCK CONSTRUCTED *IN THE DRY* WITH MORETRENCH WELLPOINTS



On December 2, 1957, the keel for the first U. S. nuclear-powered surface warship was put down in this drydock in Quincy, Mass.

Contractor: Perini Corp., E. Boston, Mass.
Owner: Bethlehem Steel Company, Quincy, Mass.

To build this history-making vessel and other large ships, Bethlehem Steel Company constructed a giant graving dock, 900′ long and 500′ wide, on the shore of the Fore River.

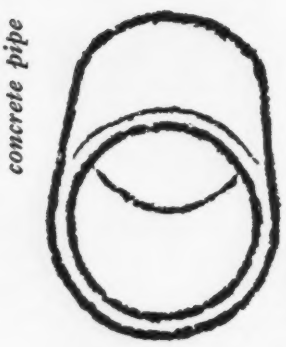
MORETRENCH WELLPOINTS helped to speed foundation progress by relieving a 40′ head of water in silt, very fine sand, and gravel. Excavation to firm, dry material was rapid—and safe.

No matter what your dewatering problem is, we'd like to help. For down-to-earth facts on how to work with economy "in the dry", call us.

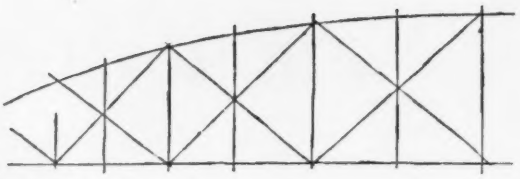
MORETRENCH CORPORATION

90 West St.	4900 S. Austin Ave.	7701 Interbay Blvd.	315 W. 25th St.	Rockaway
New York 6	Chicago 38, Illinois	Tampa 9, Florida	Houston 8, Texas	New Jersey
CO 7-2283	Portsmouth 7-4212	Tampa 61-1881	Underwood 4-7774	Rockaway 9-2100

Western Representative: Andrews Machinery of Washington, Inc., Seattle 4, Washington
Canadian Representative: Geo. W. CROTHERS Limited, Toronto, Ontario
Brazilian Representative: Oscar Taves & Co., Ltd., Rio de Janeiro

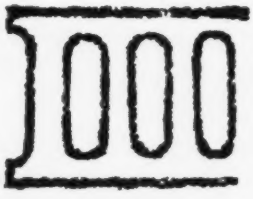


concrete pipe



pre-stressed

New Performance Standards FOR ALL THREE:



concrete block

SMITH TURBINE-TYPE MIXER

This is the phenomenal new mixer
being talked about in dozens of industries—
the mixer with an entirely different principle.
"LIVE MIX" is the answer.
Mixing is done in a doughnut-shaped drum.
There is no "dead center" area.
Blades set up a braiding action
which breaks down centrifugal forces.
As a result the Smith Turbine-Type Mixer
mixes at a peripheral rate
of *six hundred feet per minute!*

unbelievably fast

Regardless of your application,
you can figure on a *practical* operating speed
several times faster
than conventional design mixers.

Besides tremendous speed,
the new Smith gives your product
a combination of three significant advantages

1.	2.	3.
Greater strength	Better uniformity	Higher density

Data is available
for both heavyweight
and lightweight
concrete mixes.
Write for details.

SMITH

Since 1900, the pioneer designer and foremost manufacturer of the world's finest mixers.

THE T. L. SMITH COMPANY • **Milwaukee, Wisconsin** • **Lufkin, Texas**

Affiliated with Essick Manufacturing Company, Los Angeles, Calif.

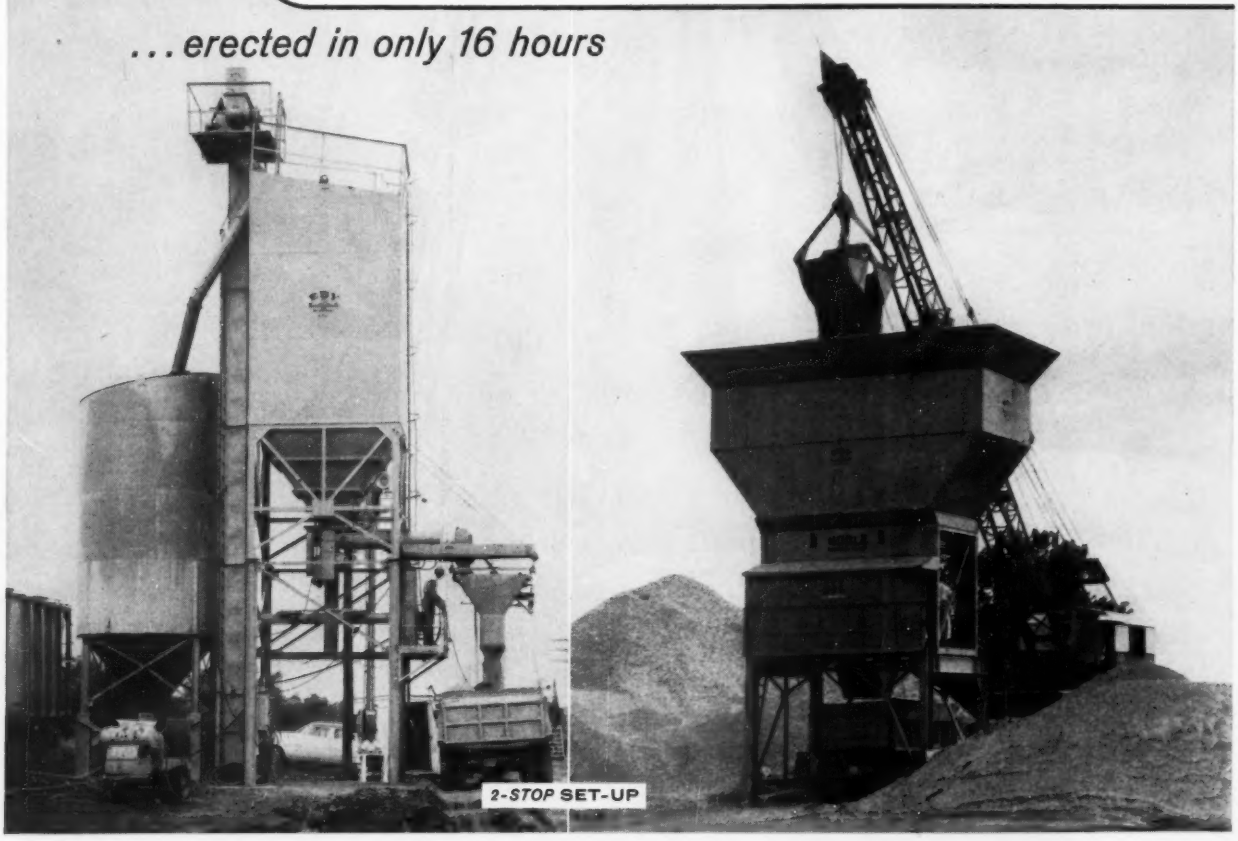
Driving Bridge Foundations

• This pair of driving rigs is putting in pipe pile foundations for three bridges on an extension of the New Hampshire Turnpike. They are a Link-Belt 98 crawler and an American 30-ton truck crane equipped with 70-ft leads and McKiernan-Terry DE20 diesel hammers. The rigs drive L. B. Foster spiralweld 12-in. dia pipe in 60-ft lengths. On the three jobs they will drive 40,000 lin ft of piles. H. B. Fleming, Inc., of South Portland, Me., is doing the work under a subcontract with Manchester Sand, Gravel and Cement Co.

NOBLE BATCHING PLANTS... paving profits on more

Highly portable NOBLE plant batches specification concrete accurately in large volume. It handles virtually any paving job anywhere. Moved frequently at low cost with minimum down-time, NOBLE completes the job faster. Paving contractors can take on additional jobs during limited working season. NOBLE is adaptable to any size job or batch requirement. It can be set up as a dual *single-*

... erected in only 16 hours



2-STOP SET-UP

Martin K. Eby Construction Co., Wichita, Kansas, required a batching plant to supply concrete for a 100,000 square yard extension of airfield runways at Rosecrans Field, St. Joseph, Missouri. Their NOBLE plant having completed a job at Wichita, Kansas, 300 miles away, was dismantled in 10 hours, transported by rail to St. Joseph, Missouri, and reassembled in only 16 hours on low-cost slab footing. The plant batches sand, aggregates and cement in a *2-stop* set-up. The cement batcher weighs, records and discharges 742 lbs. of cement in 12 second cycles. The twin aggregate batcher weighs, records and discharges 4300 lbs. of materials in 15 second cycles. Plant output is over 300 cubic yards per hour. Overhead aggregate bins are charged with a 3½ cubic yard clamshell bucket. Scales, controls, electrical system and other major components are factory installed.

WRITE FOR CIRCULAR

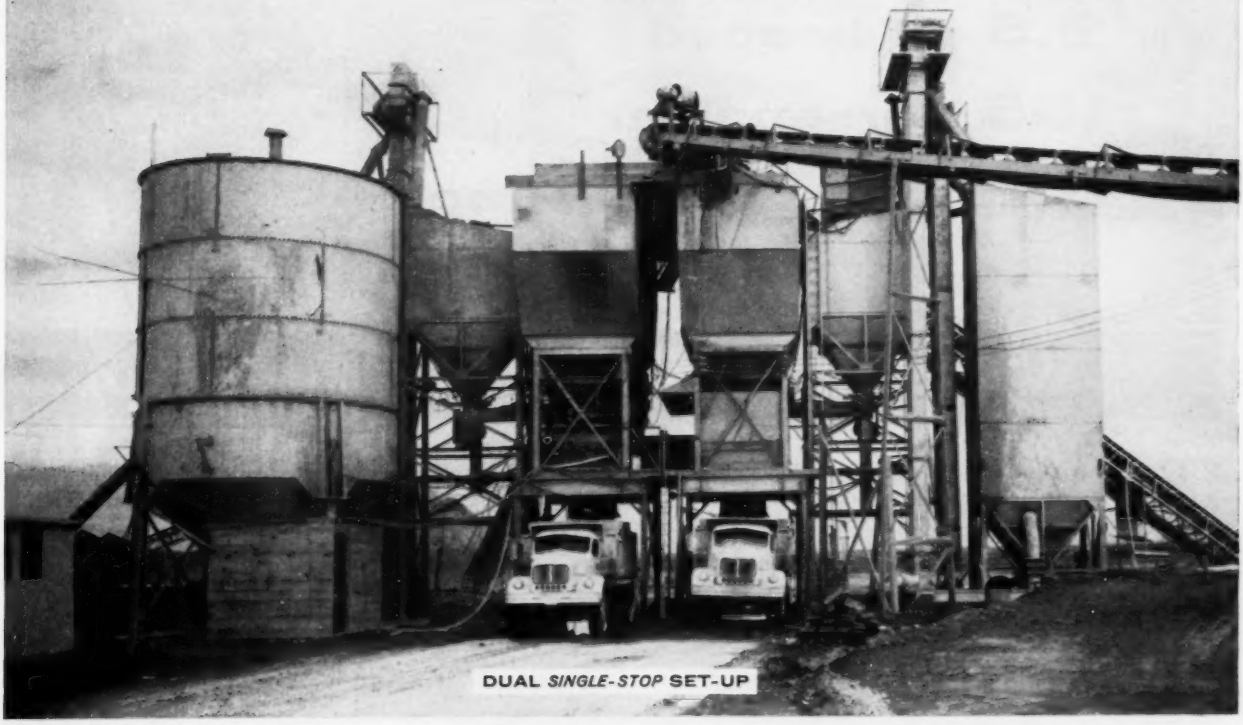
NOBLE CONCRETE BATCHING PLANTS

NOBLE COMPANY • 1860-7TH ST., OAKLAND, CALIF. • TEMPLEBAR 2-5785
Branches:
CLEVELAND 16, OHIO—20950 Center Ridge Road, EDison 1-3426
SEATTLE 9, WASHINGTON—518 First Ave. North, ATwater 4-4878
EL SEGUNDO (LOS ANGELES), CALIF.—218 Richmond St. { ORegon 8-6473 / EAstgate 2-4518
DALLAS 35, TEXAS—2512 W. Mockingbird Lane, FLeetwood 7-1904
NEW YORK 17, N. Y.—52 Vanderbilt Ave., ORegon 9-6475
Export Distributor, Frazar International Corp., San Francisco

on-the-move making bigger highway and airfield jobs

stop plant for airfield construction or split into 2 complete plants for separate highway paving jobs in *1-stop* or *2-stop* set-ups controlled by a single operator. Read in the operational stories below how NOBLE plants are profitably used by two leading contractors. Get a NOBLE plant and profit from a larger share of highway and airport paving. Inquire today.

. . . batches average of 4,000 cubic yards of dry materials per day

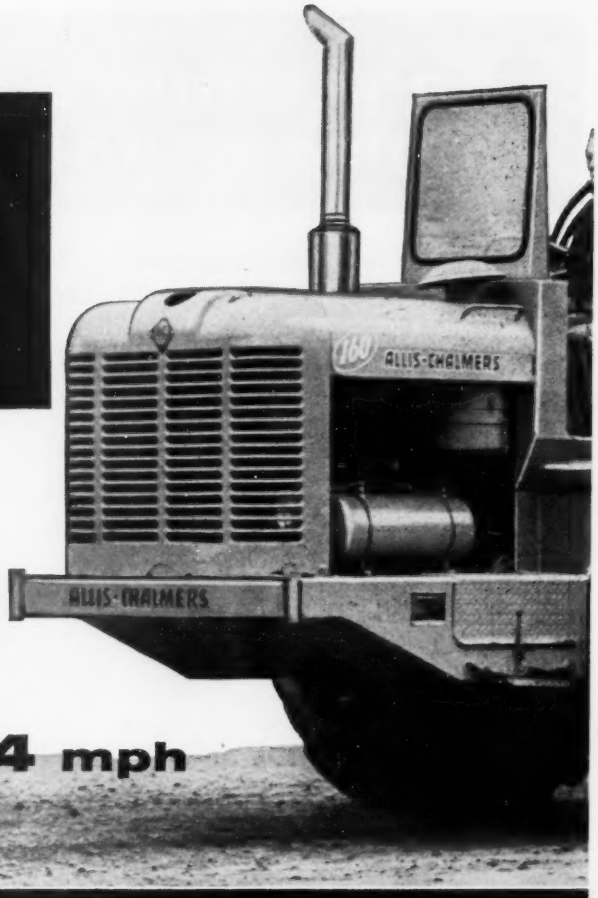


DUAL *SINGLE-STOP* SET-UP

Two NOBLE plants are batching materials for the construction of 258,000 cubic yards of portland cement concrete pavement at Mather Air Force Base, California. Operating considerably under capacity, the plants load dry batch trucks supplying 4 dual drum pavers. 3 different materials . . . 1½" rock, ¾" rock, sand . . . are stockpiled separately and supplied to both plants by three independent conveyor systems operated by one man. Each plant batches both cement and aggregates and has 150 tons of overhead aggregate storage and 375 barrels of overhead cement storage. Separate ground silos store an additional 3,600 barrels of cement. From its former location at McClellan Air Force Base, California, one of the NOBLE plants was dismantled, loaded and hauled by trucks within legal highway width to Mather Air Force Base, reassembled and put into operation all within 10 days, reports Henry J. List, Project Manager for Gordon H. Ball, Inc., general contractor.

DISTRIBUTORS: BIRMINGHAM, ALA., Equipment Service Co., Inc. • LOS ANGELES, CALIF., Smith-Booth-Usher Co. • DENVER, COLO., Western Machinery Co. • MIAMI, FLA., Neff Machinery Inc. • CHICAGO, ILL., Arrow Contractors Equipment Co. • INDIANAPOLIS, IND., Manwaring Machinery Co., Inc. • CEDAR RAPIDS, IOWA, James W. Ball Co., Inc. • LOUISVILLE, KY., Emmett C. Watson Co. • BALTIMORE, MD., General Supply & Equipment Co. • BOSTON, MASS., Hedge & Mattheis Co. • DETROIT, MICH., R. G. Moeller Co. • ST. PAUL, MINN., Borchert-Ingersoll, Inc. • BILLINGS, MONT., Seitz Machinery Co., Inc. • KANSAS CITY, MO., Funkhouser Machinery Co. • ST. LOUIS, MO., George F. Smith Co. • DUNELLEN, N. J., Miller Equipment Co. • ALBUQUERQUE, N. MEX., Contractors Equipment and Supply Co. • CLEVELAND, OHIO, Wepco Equipment Co. • OKLAHOMA CITY, OKLA., Herd Equipment Co. • PORTLAND, ORE., Clyde Equipment Co. • PITTSBURGH, PA., Equipment & Supplies, Inc. • NASHVILLE, TENN., Paterson Machinery Co. • DALLAS, TEX., North Texas Equipment & Supply Co. • EL PASO, TEX., Border Machinery Co., Inc. • HOUSTON, TEX., Pearce Equipment Co., Inc. • SAN ANTONIO, TEX., Contractors Machinery Co. • WACO, TEX., Richards Equipment Co. • SALT LAKE CITY, UTAH, Arnold Machinery Co., Inc. • SEATTLE, WASH., Star Machinery Co. • SPOKANE, WASH., Intermountain Equipment Co. • CASPER, WYO., Studer Tractor & Equipment Co., Inc. • CALGARY, ALB., Precision Machinery & Equipment, Ltd. • VANCOUVER, B. C., Westcoast Equipment Co., Ltd. • WINNIPEG, MAN., Huggard Equipment Co., Ltd. • TORONTO, ONT., Ontario Equipment & Supply, Ltd. • MONTREAL, QUE., Laurentide Equipment Co., Ltd. • JACKSONVILLE, FLA., Graze-Dempsey, Inc.

Allis-Chalmers TS-160



7 yd struck

9.5 yd heaped

155 horsepower

5 speeds to 25.4 mph

12-ton payload

Measure these advantages for

22 hp per struck yard—Big Allis-Chalmers supercharged diesel engine delivers extra lugging ability for tough pulls, fast loading. Versatile TS-160 can team up with big equipment or work alone on long- or short-haul construction jobs—handle a wide range of utility jobs, travel at speeds up to 25.4 mph.

Measure these features . . . Allis-Chalmers 516-cu-in. diesel engine—dependable power at all working speeds • Independent, constant live hydraulic power for steering and scraper operation • Low, wide bowl—8-ft, 1½-in. cutting edge . . . 3-piece, interchangeable cutting edges . . . double-acting hydraulic bowl lift jacks • Positive hydraulic ejection, high apron lift to full 7-ft, 1½-in. opening • Roomy operator's compartment, easy-to-reach controls, 24-volt direct electric starting, adjustable bucket-type seat, synchronized 4-wheel air brakes • Big push block for all types of pushers.

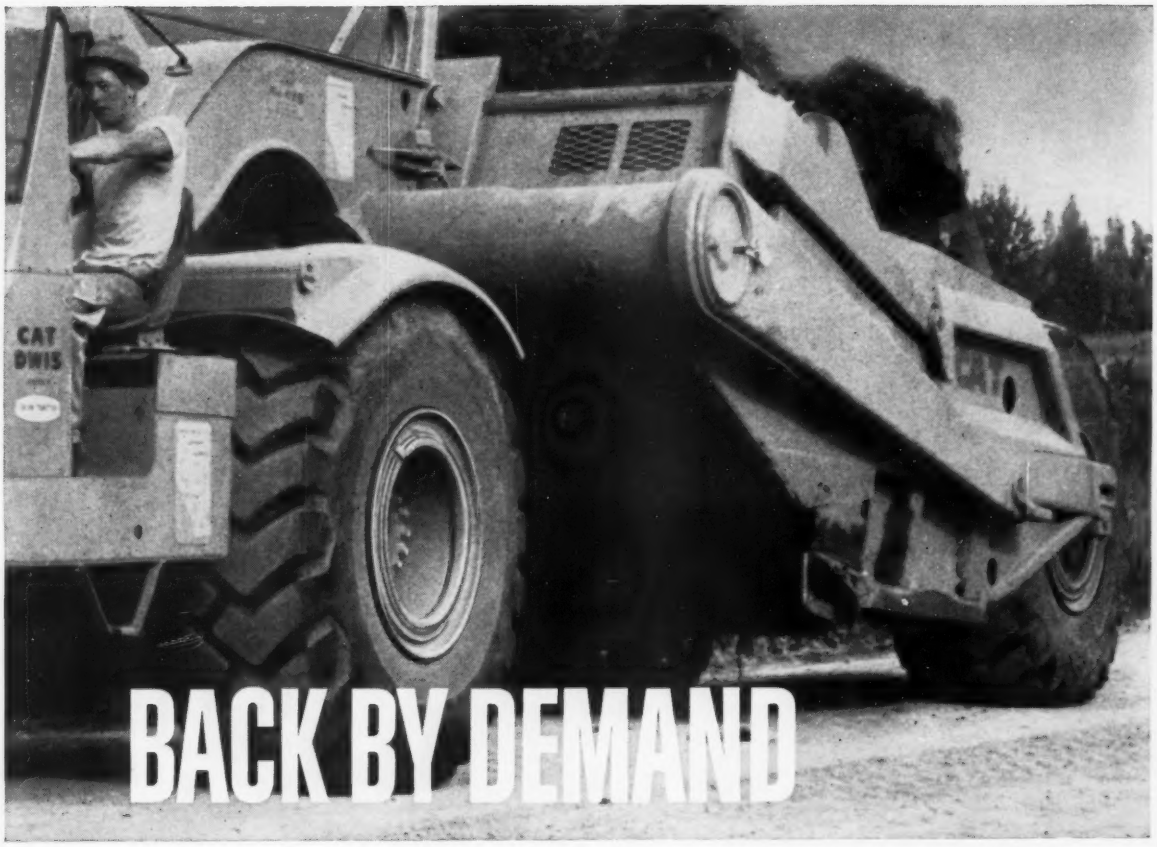
a wide range of earth-moving jobs...

Turns non-stop in less than 25 ft with 90-degree hydraulic steering... easy maneuverability in narrow cuts, faster cycles without reversing in tight turn-arounds.

Moves quickly from job to job... when required, transport wheels are available to meet legal load limits for highway travel.

ALLIS-CHALMERS CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS



where big jobs begin!

Firestone Earthmover Rims with Dyna-Tite air seal!

Firestone builds new strength into off-the-highway rims! *Fusion-welding* by Firestone's exclusive balanced weld design gives equal penetration inside and out for maximum strength. The new *Dyna-Tite air seal* makes rim completely airtight. It's the truest rolling rim you can own—reduces sidewall flexing, results in cooler running tires, cuts downtime. It's stress-tested and specially reinforced at high strain points. For tubed or tubeless off-highway tires.

INTERCHANGEABLE in complete units or by components with all earthmover rims and parts.

SPECIAL PROTECTION against rust and corrosion for longer rim life, stronger tire performance.

DYNA-TITE AIR SEAL . . . the greater the pressure, the tighter the seal.

FIRESTONE STEEL PRODUCTS CO.

AKRON, OHIO

Construction News in Pictures...

Battling the Current

Two 10-ton boulders tumble out of a dump truck to help close a narnow gap in the upstream cofferdam at Rocky Reach Dam on the Columbia River in Washington. Force of the current in this stretch of the river is so great the contractor tied the big boulders together in bundles of two or three with steel cable anchored in holes drilled through the rock.

Heavy Frame

P&H truck crane swings massive welded plate girder into place for a $23-million addition to the Thomas Jefferson High School in Elizabeth, N. J. The girder is 80 ft long and 4 ft deep. It weighs 14 tons. Elizabeth Iron Works is erecting 600 tons of steel with bolted connections. Daniel McCarron and Son, Inc., is the general contractor.

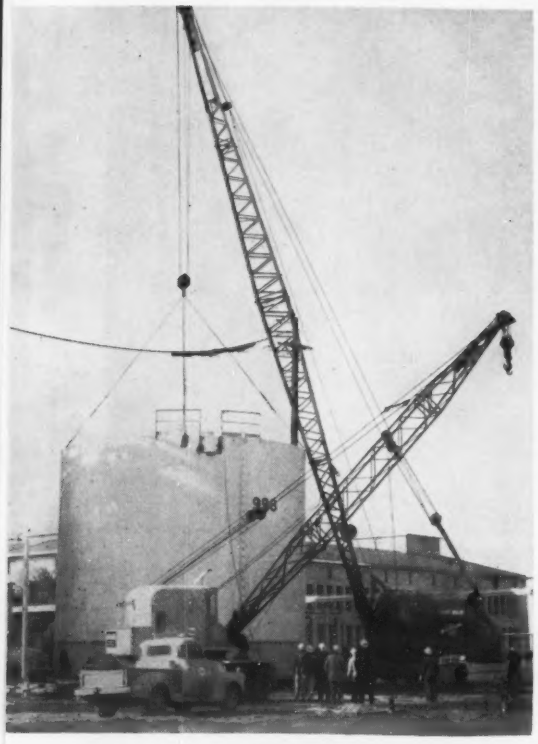
Into the Ditch

Three International TD-24's with Superior sidebooms lower a section of a 52-mile natural gas pipeline between Morris and Chicago, Ill. Midwstern Constructors, Inc., of Tulsa, Okla., is laying an average of 4,000 ft of pipe in a 10-hr day for Texas-Illinois Natural Gas Pipeline Co. Production has reached a peak of 6,400 ft in one day.

continued on next page

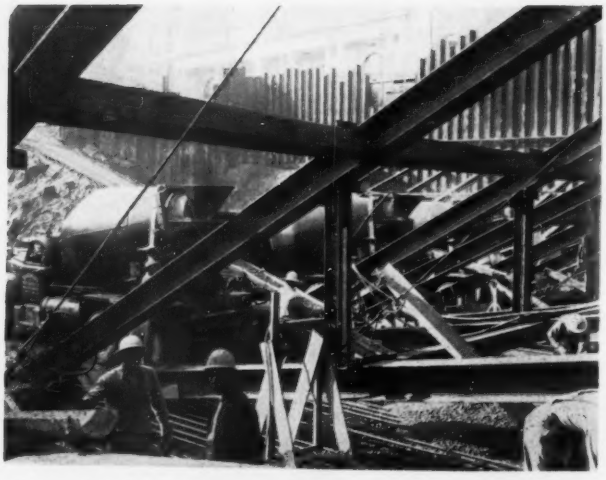
Looking Up

Crane lowers materials to workmen at bottom of 200-ft-deep surge chamber at Swift Dam, Pacific Power & Light Co.'s big hydroelectric project on the Lewis River in Washington. The 55-ft-dia surge chamber will ease back pressures in a 1,575-ft-long power tunnel. Crews have just holed through on the tunnel after 14 months of work.



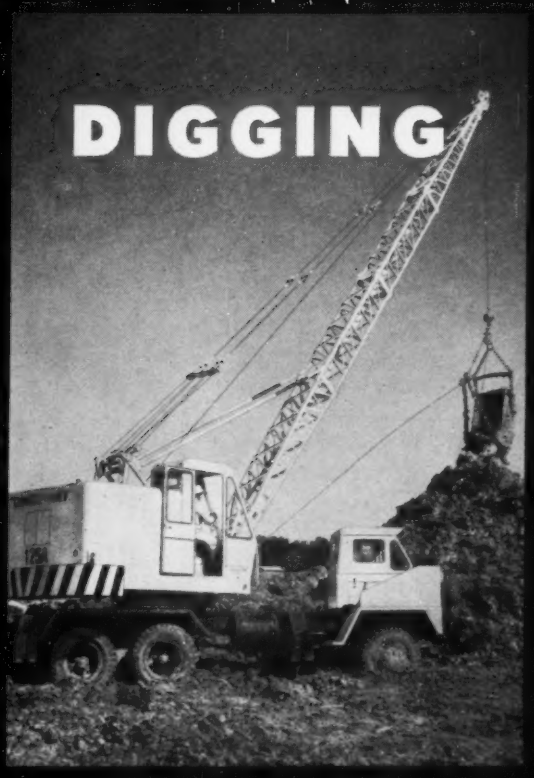
Walked into Place

Manitowoc crawler crane lowers a 40-ton oil storage tank into place on a new foundation at the Esso Standard Oil Co. refinery near Baton Rouge, La. The Manitowoc "walked" the heavy tank to its new location. The smaller Lorain truck crane assisted by placing wood mats along the route for the heavily loaded Manitowoc to walk on.

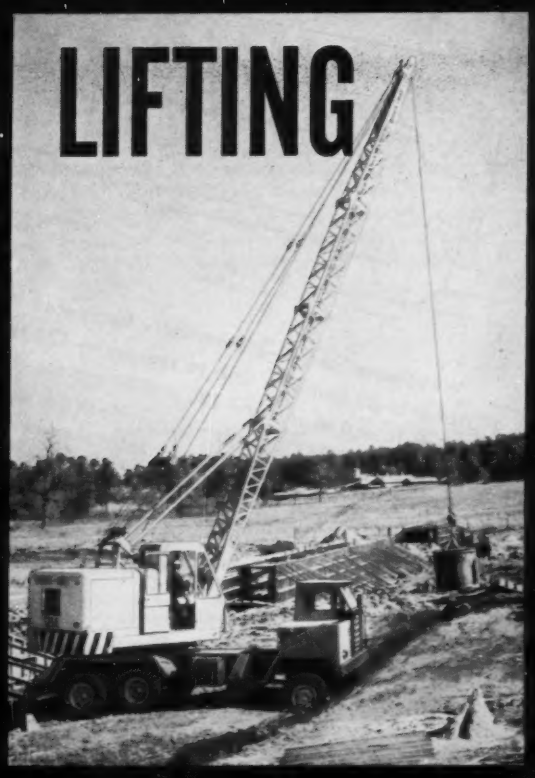


Foundation Concrete

Transit-Mix trucks chute concrete around the heavy raker beams that brace perimeter sheet piling at the site of the $15-million Crown Zellerbach Building on Market Street in San Francisco. The concrete foundation mat for the 20-story building will be 8 ft thick. Haas & Haynie Corp. of San Francisco is the general contractor on the job.



DIGGING *or* LIFTING



"QUICK-WAY"® is an all-around money-maker!

Here's a "QUICK-WAY" 125-A owned by Montgomery Construction Company, San Antonio, Texas, doing a job in Huntsville. These photos show the Montgomery machine digging out a culvert and then pouring concrete on the same job.

The five-model "QUICK-WAY" truck shovel line has been especially engineered to offer companies, like Montgomery, all the small shovel versatility with all the big shovel features. The "QUICK-WAY" has been engineered to meet rugged heavy duty specifications with fewer moving parts. The power train is oversized, all shafts are splined for easy maintenance. Extra strength has been built in the machinery frame and gantry for greater lifting power.

"QUICK-WAY" 125-A shovels are available in 6/10 yd., 12½ ton truck mounts; 105-A in 5/10 yd., 10½ ton truck crane; 105-AC in 5/10 yd. crawler; 85-A in 4/10 yd., 8½ ton truck crane; and 85 AC in 4/10 yd. crawler.

"QUICK-WAY" is the only truck shovel offering an interchangeable, hydraulic grading, digging attachment—the new UTILO-SCOPE makes dozens of jobs possible with only a single attachment.

"QUICK-WAY" has more big shovel features...with more engineered attachments...to handle more kinds of jobs...with greater profits.

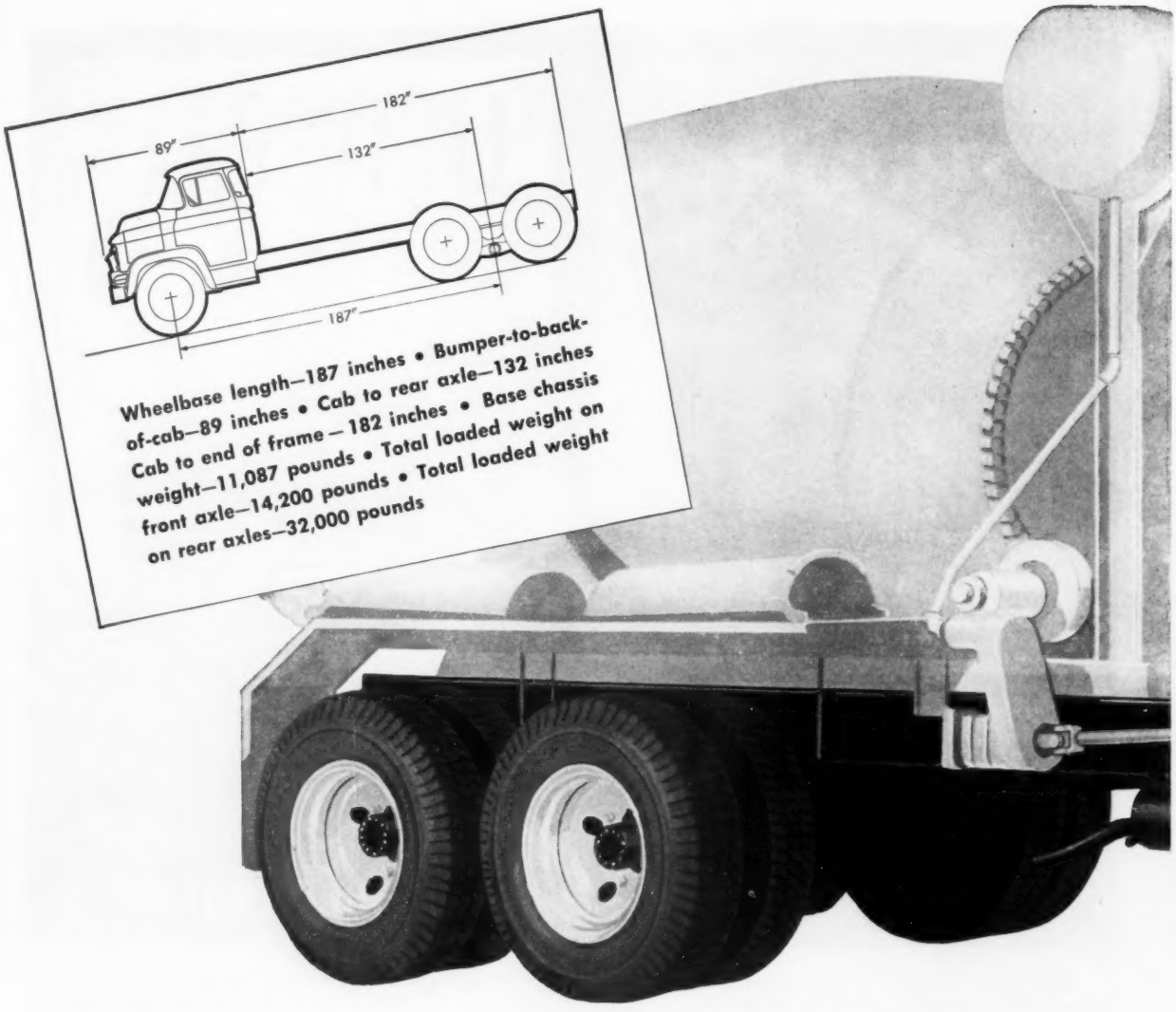
For demonstrations and prices, see your "QUICK-WAY" distributor

"QUICK-WAY"® TRUCK SHOVEL COMPANY

a Koehring subsidiary — DENVER, COLORADO

"QUICK-WAY" Truck Shovel Co., 2401 E. 40th Ave., Denver 5, Colo.
Please send detailed bulletin on the new "QUICK-WAY" UTILO-SCOPE hydraulic digging attachment.

Name_____
Company_____
Address_____
City_____ State_____


182"
89"
132"
187"
Wheelbase length—187 inches • Bumper-to-back-of-cab—89 inches • Cab to rear axle—132 inches Cab to end of frame—182 inches • Base chassis weight—11,087 pounds • Total loaded weight on front axle—14,200 pounds • Total loaded weight on rear axles—32,000 pounds

Now - haul 7 yards

in nearly all of the 48 States!

GMC's spanking-new FW556 is your truck! For no other regular, in-production model anywhere can haul 7 full yards at a clip—even in states with limitations as low as 46,400-lbs. gross

You see, this rig's all "muscle": with ⅜-inch heat-treated frame rails that eliminate the need for reinforcement—rubber "biscuit" mounting instead of steel springs—aluminum saddles and wheels.

The pay-off is a vehicle weight of only 11,087 pounds. Add 6,760 lbs. for a lightweight mixer, and you still have room for 28,350 lbs. of payload—all within a 46,200-lb. total.

ILLUSTRATED GMC FW556 MONEY-MAKER is just one of a complete line of GMC's *extra-stamina-engineered* for construction work. They're available with conventional, dual-purpose or c.o.e. cabs—gasoline or Diesel power—regular or Allison Torqmatic* transmissions.

**Optional at extra cost*

# of mix every trip

Power to haul these extra-size loads comes from GMC's 370-cubic-inch V8. It delivers 232 high-torque horsepower that takes on the toughest on-and-off-the-road work without breathing hard. And it turns the 7-yard barrel, too—through its front-end PTO.

But the real eye-opener is its price tag! For all these advantages are yours at a figure *hundreds of dollars* lower than anything else close to its class. Check that at your GMC dealer's!

GMC TRUCK & COACH—*A General Motors Division*

GMC-America's Ablest Trucks

Available in models from ½ to 45 tons

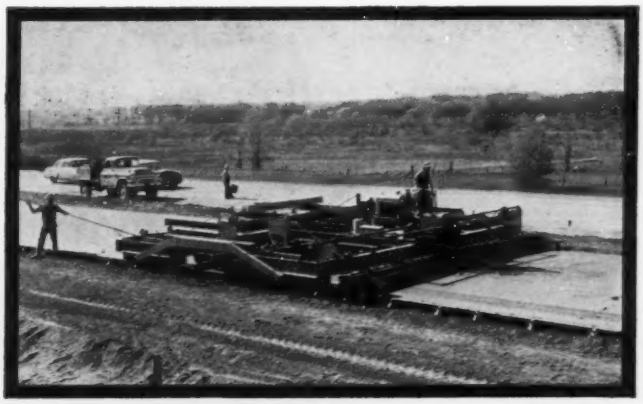
Heltzel Flex-Plane

UNITIZED BATCHING PLANTS to further speed set-up and dismantling time . . . to give you even greater on-the-job flexibility. The new Heltzel Unitized Plant—like these on a G. Toccalino & Son job in Detroit—is designed in three easy-to-handle sections that go together in minutes. This installation is set up as push-button drive-through for extra fast service. Batcher and scale unit is integral part of center section . . . a real time-saving innovation. (Note new Heltzel E-4 twin-batcher cement plant.)

2202

THE HELTZEL STEEL FORM AND IRON

FLEX-PLANE COMBINATION FINISHER-FLOAT does two jobs in one, reducing crew time to an absolute minimum. The combining of these two jobs is a natural—results in a better finish in faster time. This new machine was thoroughly tested on several jobs last season. Contractors report 4000 feet of 24-foot pavement was floated and finished in a normal day with but two or three hand finishers required. Get the facts on this profit maker before submitting too many quotations.



Engineering

brings you unitized batching, improved forms and a new way to finish concrete

Modern highway design demands top efficiency in highway construction machinery. Portable . . . versatile . . . automatic . . . *fast*.

That's why Heltzel Flex-Plane Engineering works to give you the most modern road-building equipment obtainable. Up-to-date engineering, for example, has produced a definite contractors' preference for Flex-Plane over all other makes. This preference is based, of course, on proved performance.

Find out now what Heltzel Flex-Plane Engineering can mean to you — call on actual users of Heltzel and Flex-Plane equipment, and prove to your own satisfaction that this is the *modern* equipment for modern highway construction.

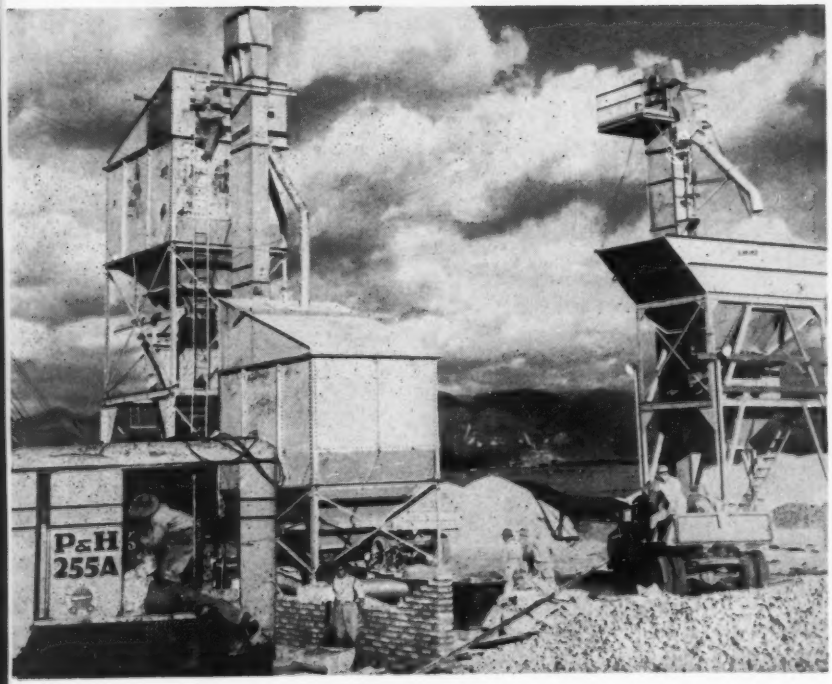
HELTZEL DUAL DUTY FORMS, such as those shown in use on the Plattsburg SAC base, have been redesigned to assure fast setting and stripping with maximum strength-weight ratio. Sizes available to exactly suit your job requirements.

COMPANY • Warren, Ohio

Construction 'Round the World...

In Sweden

Atlas Copco light-weight pusher fed rock drills mounted on mobile platforms drill blast holes for a subway tunnel through gneiss and granite under the heart of Stockholm's business district. The drills are fed by a battery of Atlas Copco air compressors, and all are equipped with Sandvik Coromat integral drill steels.



In Canada

Concrete and other building materials going into a new junior-senior high school in West Vancouver ride into place on a British-built monorail Transporter. Howden Construction Co., Ltd., contractor on the job, put the monorail to work when more than 4 in. of heavy mud proved troublesome to conventional handling equipment.

In Colombia

The Blaw-Knox batch and aggregate plants play an important role in the construction of concrete runways for the Bogota International Airport. The plants along with a fleet of Blaw-Knox paving machines make the job one of the best equipped in Colombia, a country where huge labor gangs handle most heavy construction.

BILL'S IN A SIZZLE

an ordinary tire "blew" the job

but BOB'S ON SCHEDULE with

U.S. ROYAL TRUCK TIRES

contractor-proved against job delays!

Ask the boss contractors at Swift Dam, Trinity Dam, Hills Creek Reservoir or hundreds of other big projects. They've *proved* the best way to prevent costly tire delays from wrecking tight schedules is to *use U. S. Royals!*

There are 3 main reasons why. First: today's *U. S. Royal Tires themselves*—with exclusive, advanced features that deliver greater traction, strength and wear. Second: on-the-spot, know-your-stuff U. S. Royal *service*. Third: convenient, complete *retread facilities*.

Be smart—let your U. S. Royal Dealer prove how *you* can cut job delays with these contractor-proved tires. Or be even smarter—*specify* "U. S. Royal" on the next equipment you buy!

U.S.Royal Tires

U.S.ROYAL CON-TRAK-TOR®—for rugged operations where utmost traction's required

U. S. ROYAL Super FLEETMASTER—for severe service on all your off-the-road trucks

U.S.ROYAL FLEETMASTER®—Dual Purpose, Nylon—top pull *and* mileage on *and* off road

U. S. ROYAL NYLON TIRES ARE TOUGHER, STRONGER, SAFER.

US RUBBER

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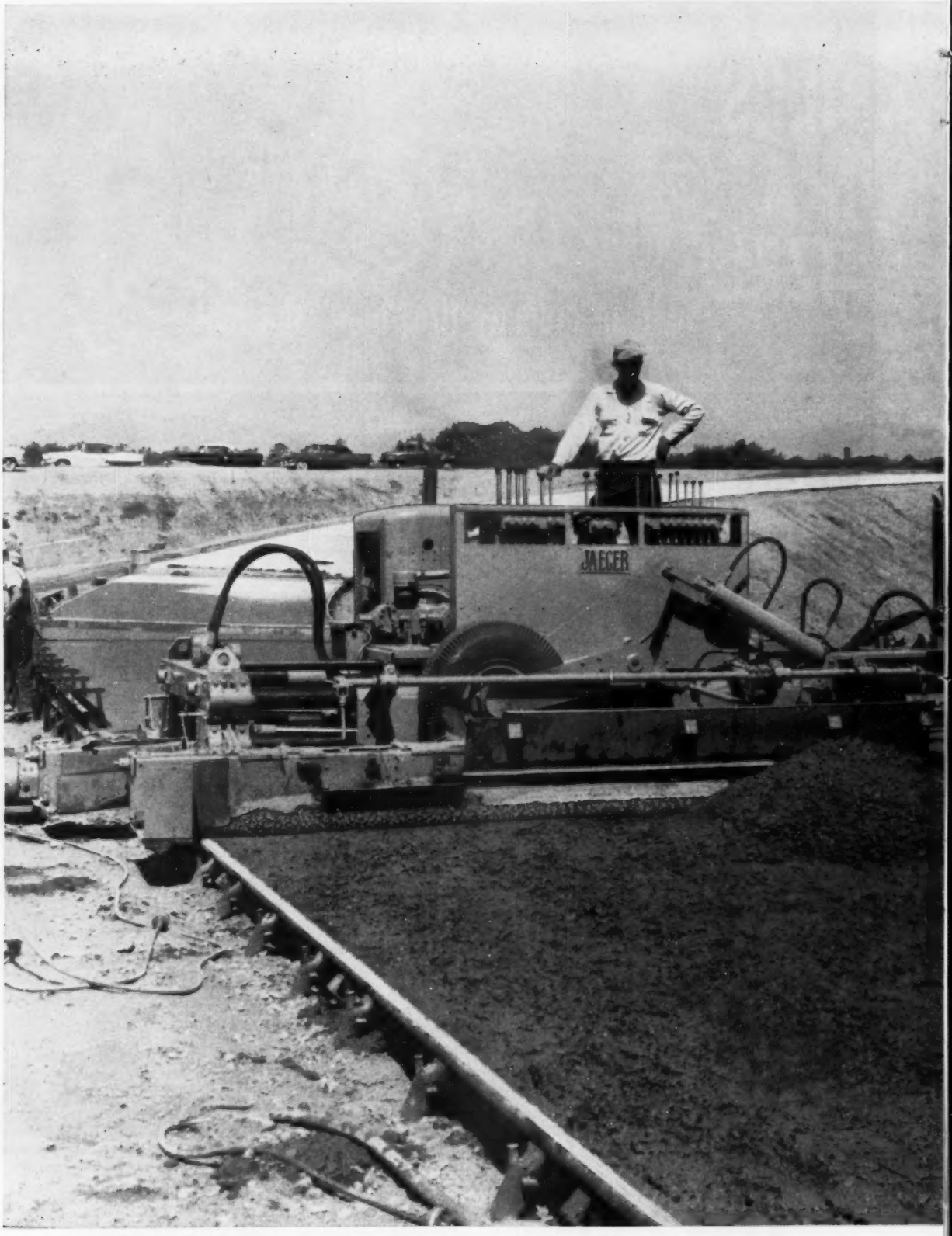
Rockefeller Center, New York 20, N. Y.

In Canada: Dominion Rubber Co., Ltd.



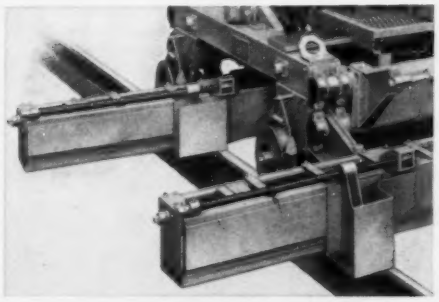
FINISHER ADJUSTED ITSELF TO SLAB WIDTHS VARYING FROM 12' TO 18' on this interchange, U.S. Routes 22 and 23 near Circleville, Ohio.

Fully available for 1958

the all-hydraulic, self-widening

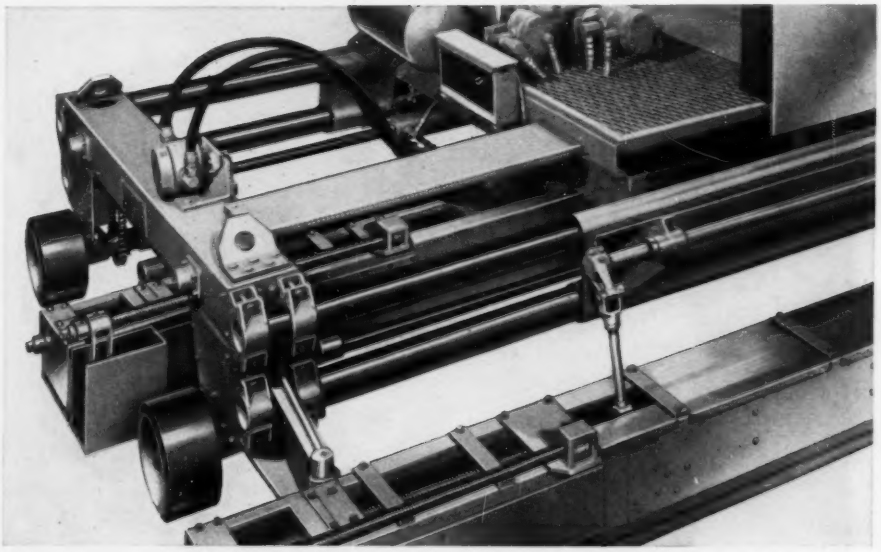
JAEGER "JX"

Accelerated winter production has enabled us to complete urgent back-orders on Type "JX" and "J" finishing machines. You can enjoy the advantages of this fast, flexible, precision-smooth finisher for your new slab work and get delivery, when wanted, by ordering now. See your Jaeger distributor, or write.



EVEN THE END SHOES ARE INFINITELY ADJUSTABLE

For variable width slab, Jaeger supplies 3′ screed extensions on which the end shoes adjust in or out on a screw merely by turning a rachet lever. Total 6′ of infinite adjustability (3′ at each end) is thus available to match the 6′ hydraulic adjustability of the finisher frame. With additional 2′ width adjustability by shifting wheels, standard 12′-18′ Jaeger can lay 10′-18′ width; 18′-24′ model lays 16′-24′; 24′-30′ model lays 22′-30′.



ALL-HYDRAULIC OPERATION gives you 6′ of infinite width adjustability with the touch of a lever — a tremendous time-saving on today's variable width work. Also gives you smooth, hydraulic drive and finger-touch control of traction, screeds, diagonal rear screed swing, tamper attachment and transportation wheels — all operations.

No mechanical transmissions. Gear-type hydraulic pumps power everything.

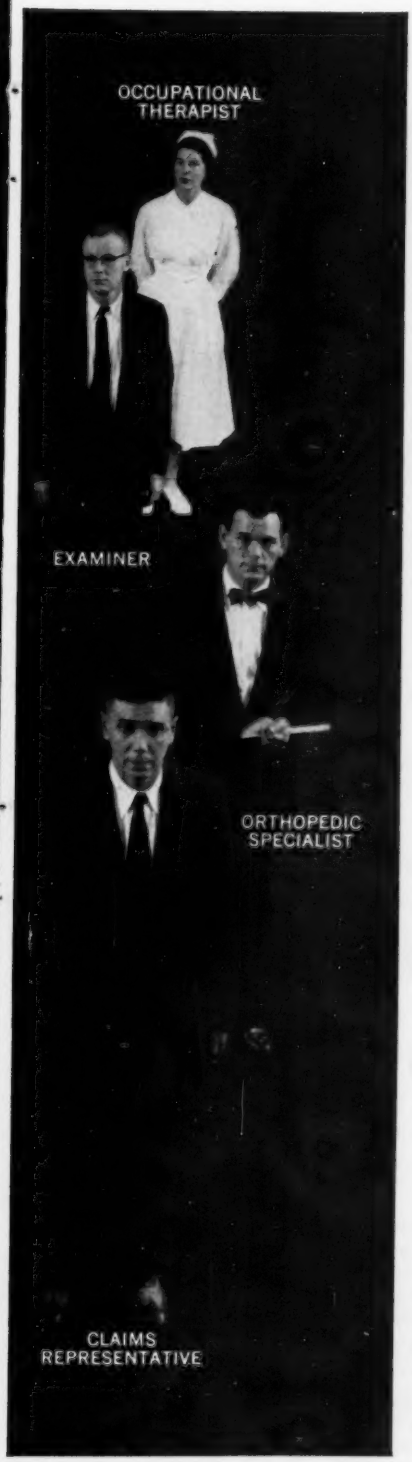
THE JAEGER MACHINE COMPANY • 800 Dublin Avenue, Columbus 16, Ohio

Jaeger Machine Co. of Canada, Ltd., St. Thomas, Ontario

CONCRETE SPREADERS • AGGREGATE SPREADERS • COMPRESSORS • PUMPS • MIXERS

LIBERTY MUTUAL INSURANCE COMPANY • LIBERTY MUTUAL FIRE INSURANCE COMPANY

HOME OFFICE: BOSTON



Insurance team saves worker's life

MAN LOSES LEG — LIBERTY MUTUAL'S "UMBRELLA OF CARE" GETS HIM BACK TO WORK

Last year, Henry W., employed by a policyholder of Liberty Mutual, had a crippling accident at work in which he lost one leg.

Twenty different professional and technical people were on the team needed to carry out his medical and rehabilitation program. These included physicians, surgeons, nurses and rehabilitation specialists, of whom 14 were on Liberty's payroll. Their work led to Henry's fine recovery. He is back on the job, adjusted to his disability and now earns more than he did before.

Liberty's method is to spread an "umbrella of care" over the injured worker. This Liberty teamwork not only benefits your employee but also reduces the chance of prolonged disability and increased cost of compensation insurance.

The Henry W. story shows the kind of protection you get when you insure with Liberty Mutual, world's largest writer of compensation insurance. Competent medical personnel work to keep losses down. In addition, Liberty assigns trained engineers to work with you — to keep men from getting hurt. Liberty also provides the best of claims service in your area to follow through on all accidents and claims.

LIBERTY MUTUAL®

The Company that stands by you®

B.F.Goodrich

How rubber chutes save $8000 to $10,000 a year

B. F. Goodrich improvements in rubber brought extra savings

Problem: That black stuff pouring out of the chute was causing plenty of trouble in this zinc plant. It's a highly abrasive sinter mix—wet, hot, and so corrosive it would eat through metal. It was wearing out chutes, made from pieces of conveyor belting, in a few weeks.

What was done: When a B.F.Goodrich distributor heard about the problem, he recommended that the chutes be made with a special kind of B.F.Goodrich rubber sheeting, called Armorite, that's especially compounded to stand terrific abrasion. This rubber is so tough, it's even used in some places to handle broken glass.

Savings: Plant men first estimated that the Armorite would last four to six times as long as the chutes previously used, and save $8,000 to $10,000 a year. Now they say it is lasting about 8 times as long. No more maintenance problems.

Extra benefits: B.F.Goodrich Armorite can be used in dozens of ways—as a liner, curtain, throw mat or pad for protection against abrasives. Can be ordered with or without a reinforcing back of fabric, fibre or steel. It often lasts 10 times longer than steel; eliminating frequent, costly replacements of abrasion-worn metal parts.

Where to buy: Your B.F.Goodrich distributor has full information on Armorite. And, as a factory-trained specialist in rubber products, he can answer your questions about *all* the rubber products B.F.Goodrich makes for industry. *B.F.Goodrich Industrial Products Co., Dept. M-303, Akron 18, O.*

B.F.Goodrich industrial products

Construction Methods AND EQUIPMENT

MARCH, 1958

VOLUME 40 • NUMBER 3

HENRY T. PEREZ, Editor

Labor in the News

SELDOM has construction labor made as much headline news as it has recently. And while some of this news has been shockingly bad, there is hope that it will result in corrective measures that will benefit the worker, the contractor, and the public alike.

Most distasteful, of course, have been revelations of the Senate's McClellan Committee during its investigation of the Operating Engineers union. Said the Senator, "This committee as well as the public, I think, has been shocked at disclosures such as:

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3. Fixed elections;
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"It is hard to imagine how democracy could be more stifled than it is within the International Union of Operating Engineers."

Management, too, came in for a scathing. McClellan took an understandably dim view of Contractor S. A. Healy, who took refuge in the Fifth Amendment when asked about his financial dealings with Union President William E. Maloney.

Perhaps the disclosures of union abuses are responsible for an entirely different type of news created by the National Labor Relations Board. It has just ordered contractors and the building and construction trades unions to drop illegal closed-shop hiring arrangements.

Unless the practice is ended by June 1, both parties face stiff penalties. Violators would jointly be liable for reimbursement to the workers of all union dues and assessments collected since the start of the contract.

Whether the legal union shop type of contract can work effectively in the construction industry, with its somewhat transitory type of employment, is debatable. But in any event, the Board's order is going to cause plenty of confusion in the months ahead.

A welcome piece of news was the 10-point statement of policy (page 99) adopted by the Building and Construction Trades Department, AFL-CIO. This goes on record against many of the featherbedding and restrictive labor practices that contractors have long complained about but have had to live with.

The statement was ratified by 19 general presidents of building trades unions. But that ratification will mean nothing unless the principles are put into practice at the union local level. Only then will the contractor receive his "full day's work for a full day's pay." And only then will the buyer of construction get all he pays for.

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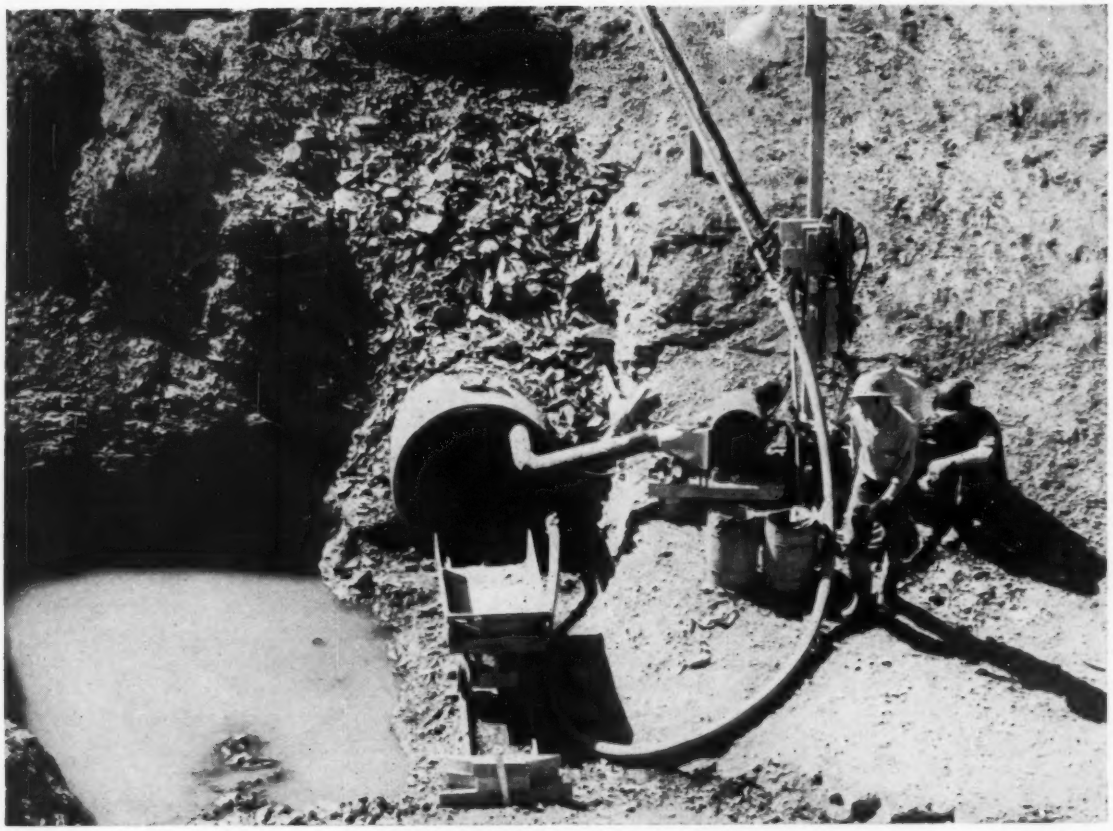


TUNNEL PORTAL—Tiny muck car waits to be pushed into 42-in. ID plate-lined bore in steep bank of Missouri River. Muck goes to pit at left, clammed out periodically.

Small-Diameter Tunnel Job

OAHE DAM, the world's largest compacted earth structure, is responsible for what may be one of the world's smallest driven tunnels—approximately 1,000 ft of bore that is only 42 in. in dia inside the liner plates.

The tunnel job is part of an Army Engineer project to provide a new water system for Mobridge, S. D. The city's existing plant will be flooded out by water backing up behind the big dam.

Whittle Contracting Co. of Dallas, Tex., carved out the tunnel as part of a $535,000 contract for the intake structure. Tunneling was conventional but scaled down to the size of the bore.

Circumstances dictated the design of the new intake. Until closure of the Missouri River — scheduled for next August—Mobridge must continue to draw its water from the river. After a pool has built up, the city will take water from the reservoir. So the new intake taps both the river and the reservoir.

On high ground near the river, Whittle sunk a vertical shaft 99 ft deep. The two tunnels run out from that shaft. At the bottom of the shaft, the lower tunnel extends 1,000 ft to tap the river; 40 ft higher in the shaft, the upper tunnel runs out 450 ft to draw water from the future reservoir.

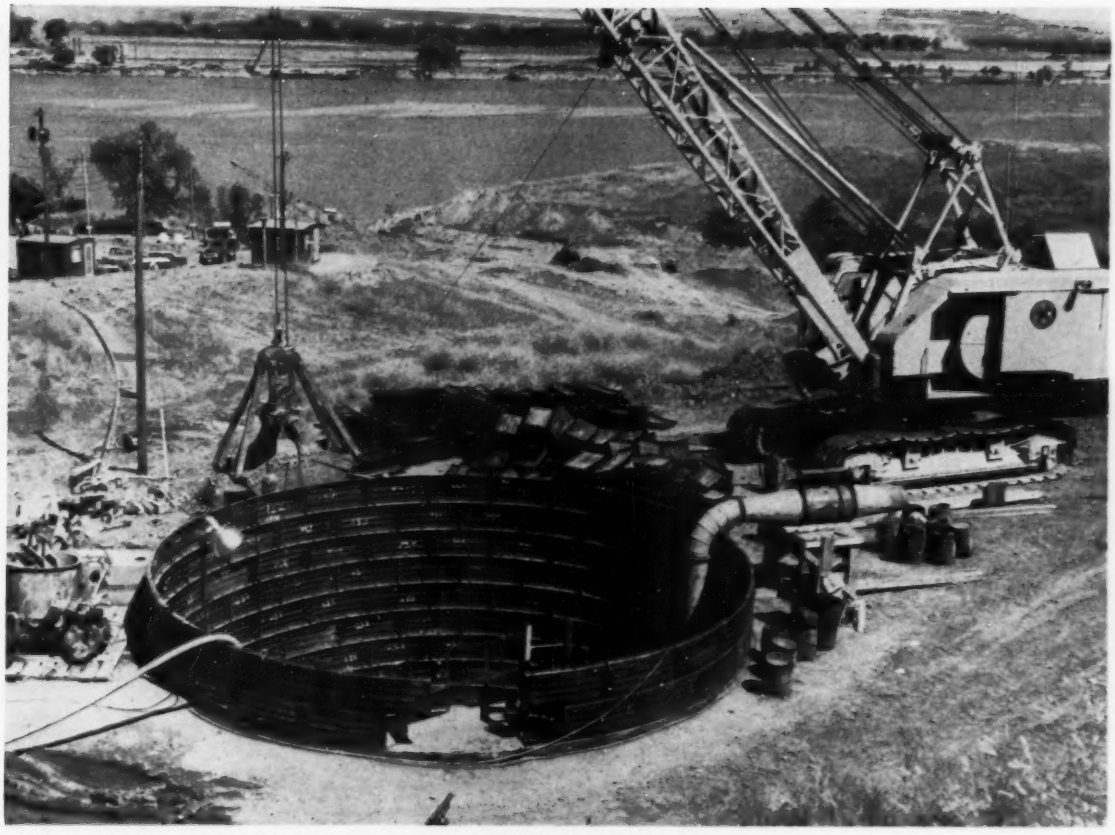
Whittle built the riverward 440 ft of the lower tunnel by cut and cover. Because of the contour of the steep hill lifting up from the flood plain, Whittle had to tunnel the remaining 560 ft of the lower intake and all of the 450 ft for the upper main.

Both tunnels run through comparatively soft, tricky Pierre shale, and Whittle decided a 42-in. bore was the smallest practical diameter even though the intake pipes will be only 20 in. dia.

Whittle brought in equipment to fit the job. They built a ½-yd muck car to roll into the tunnels on light mine rails. They worked the face with a Gardner-Denver clay spade powered by a 600-cfm Ingersoll-Rand compressor. Where shale was too tough for the spade, a 35-lb paving breaker took over.

The contractor also assigned men of short stature to the job to minimize as much as possible the cricks in the back that working in such a small bore inevitably would cause. Three men worked each of the three daily shifts, rotating from job to job. One man handled the tool; another mucked, loading the muck car with a short-handled shovel; the third tended the compressor at the portal, took care of odd jobs, and stretched cramped muscles before going back to the face.

Working around the clock,



TUNNEL TARGET—Vertical shaft sunk from high ground will be intercepted by two bores from river (rear). At left is Gardner-Denver machine for grouting liner plates.

Poses Full-Size Problems

Whittle's crews advanced the lower bore an average of 8 ft per day; in the upper bore, where it was easier going, progress averaged 14 ft per day.

All tunneling was carried out from the riverward side except for a short section of the lower bore that also was worked from the shaft in the final phase to speed the job. As work progressed, crews bolted in 18-in. sections of steel Commercial liner plates in quadrants. For safety, the face was kept within 4 ft of the liner plates, and the bore was tested for gas every 4 hr. Ventilation was provided by a 6-in. pipe carrying 3,200 cfm of air from an American or a Joy Axivane blower.

When a bore was holed through, Whittle installed the 20-in. cast iron water pipe in 20-ft sections. An Ingersoll-Rand air tugger skidded the length to place

COMPLETED SECTION—Thick ring of grout holds 20-in. cast iron water main installed in 20-ft lengths. Grout also flowed behind liner plates to seal them simultaneously.

SMALL DIAMETER TUNNEL
continued

along the top of the railroad track. There it was jacked up, the track beneath it removed, and concrete blocking placed to hold it. Then the space between pipe and tunnel liner was filled.

Original scheme was to pack this space with concrete from a Pumpcrete machine. But Whittle figured grout would be better. This eliminated the purchase of ready-mix concrete (the only available). More importantly it also eliminated the separate step of grouting behind the liner plates —prior removal of the plates' grout plugs allowed the pipe-embedment mix also to be forced out to fill voids behind the liners at the same time.

Shaft Sinking Is Tough, Too

Shaft sinking proceeded apace with tunnel driving. The shaft has two diameters. The uppermost 26 ft, which also is part of a headhouse that extends an additional 14 ft above ground, has a finished diameter of 22 ft, with 18-in.-thick concrete walls. The lower 73 ft is 17 ft in dia inside 28 in. walls.

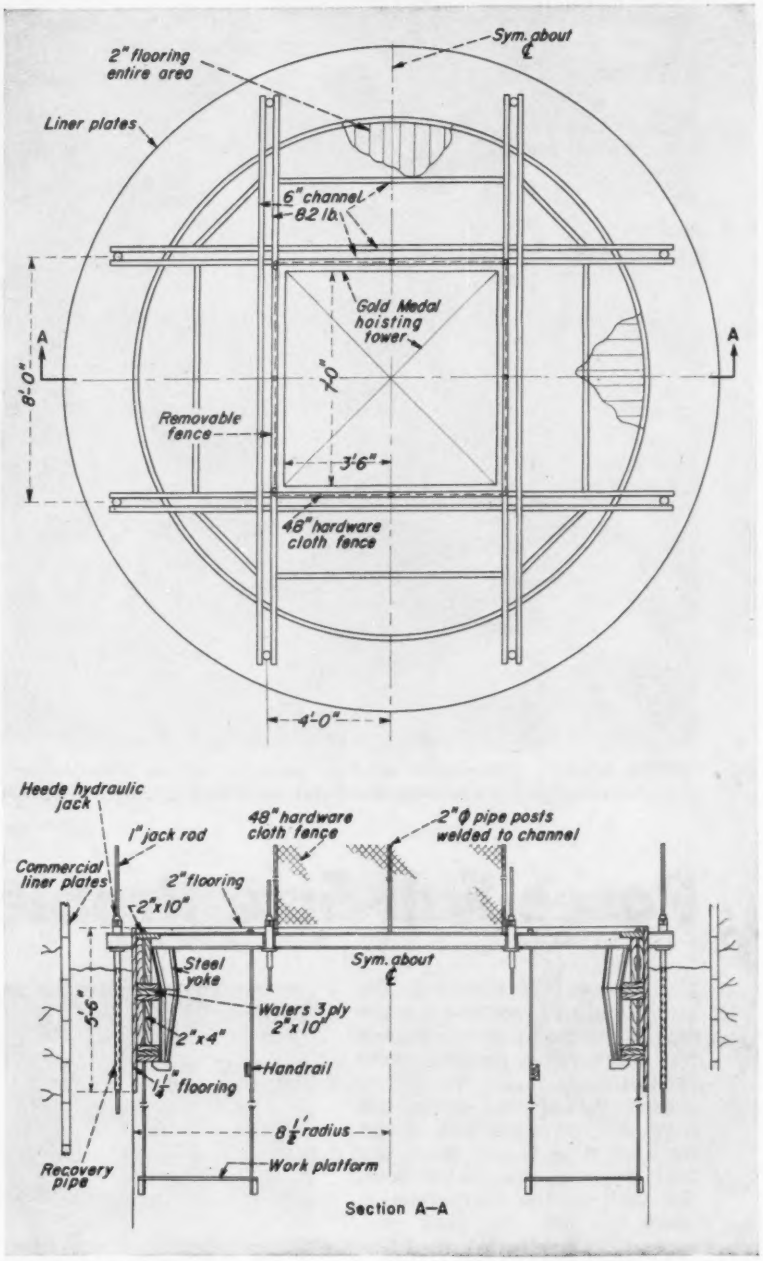
To sink the shaft, Whittle first set up a couple of rings of 16-in. Commercial liner plate and poured a concrete collar behind to hold them in place. Then a Koehring 605, handling an Owens 1½-yd heavy-duty bucket, clammed out the hole. As the shaft deepened, additional liner-plate rings were bolted on. These were grouted after each 10-ft increment of depth.

About mid-depth of the shaft, the clam encountered Pierre shale, which was too tough for it to dig economically, unaided. And because this material has the characteristic of breaking over a large area if dynamited, no explosives could be used. So Whittle took a 1,000-lb drop hammer, fitted it with a 6-in. chisel point, and mounted it in hanging leads from the Koehring machine.

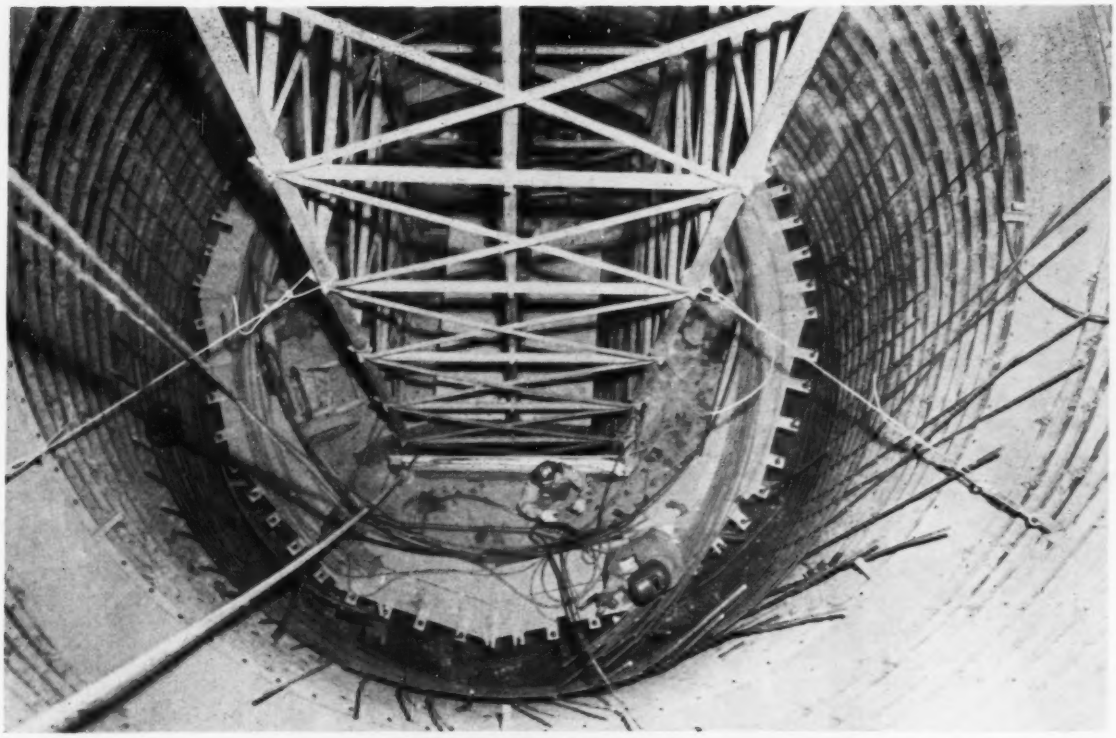
The heavy hammer-pick broke up the shale to a depth of about 1 ft. This layer then was clammed out before picking was resumed. Around the perimeter of the deepening shaft, men with paving breakers trimmed the edges and installed liner plates.

This type of exvacation was understandably slow—the more so because safety regulations prohibited men from being in the hole during lowering, hoisting, clamming, or picking. Thus there could be no simultaneous operations. Additionally, men were not allowed to be lifted in or out by crane, but had to climb a ladder.

While the shaft was being sunk and its bottom floor poured, Whittle readied a slip-form for the concrete lining. An accompanying drawing shows form details. The form carried two platforms—a lower staging for



FORM DETAILS—Concrete for 28-in. lining of lower 73 ft of shaft was poured in wood sliding form, which eight hydraulic jacks moved upward at rate of 8 in. per hr.



IN THE SHAFT—Hoist tower extends through form from base to surface to handle men and material. Slotted and bored straps extend from form to space reinforcing bars.

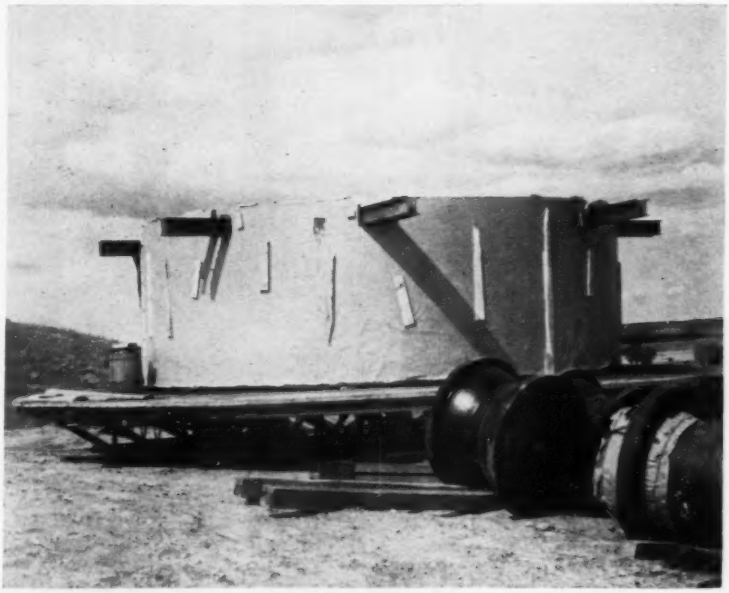
concrete finishers and an upper deck for placing reinforcing steel and concrete.

The form surrounded a Gold Medal hoist tower that sat on the shaft floor and extended above ground level. This hoist carried men and materials to the pour as eight Heede Concretor hydraulic jacks moved the form continuously upward. Rate of rise averaged 8 in. per hr.

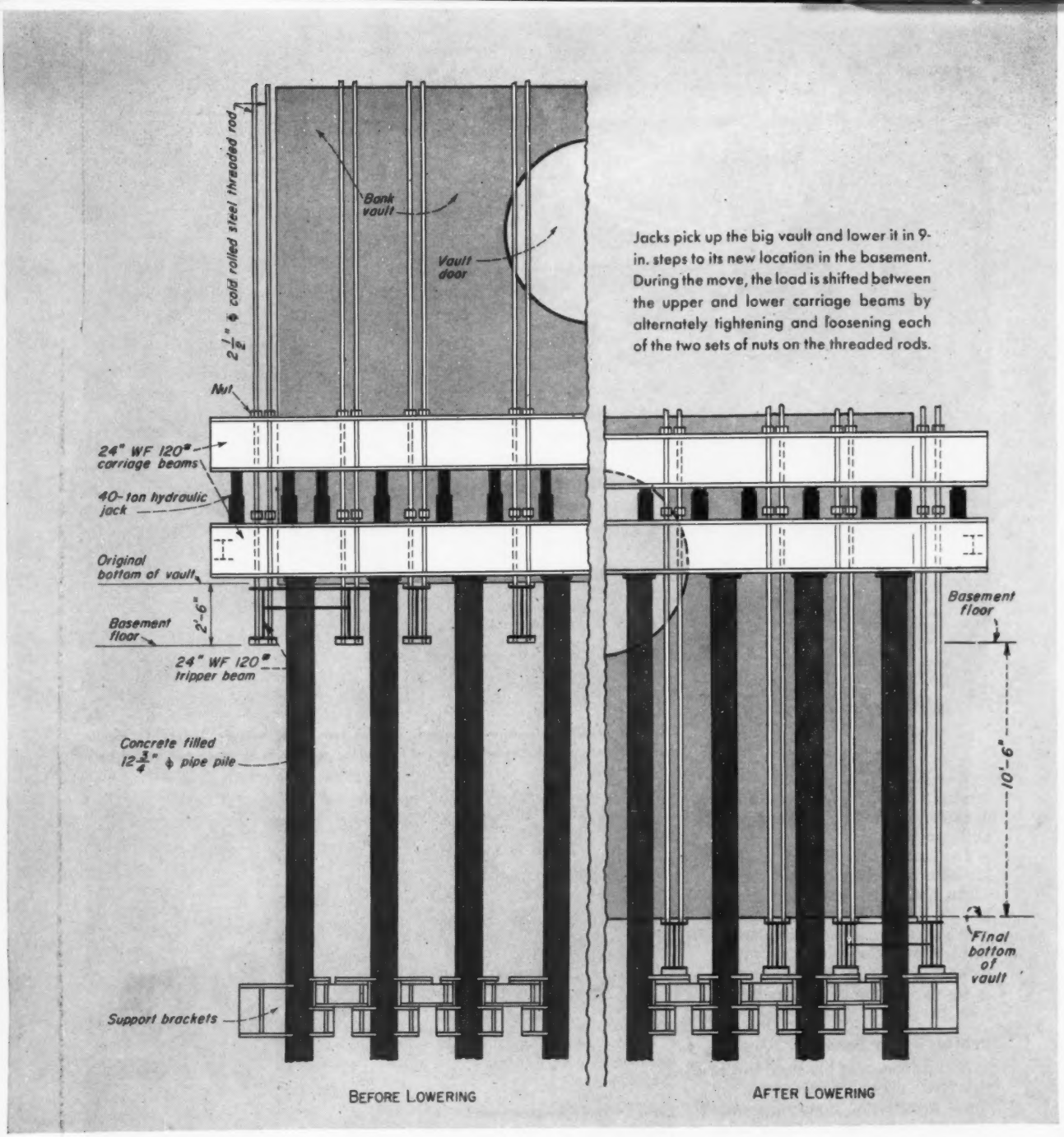
Prefab Upper Forms

A slip form was not used in the enlarged upper portion of the shaft because of numerous projections, box-outs, and the relatively short height. Instead, Whittle built wood quadrant forms about 10 ft high. Arc length of the forms was 17 ft, which left room for 3 in. wracking strips and b'ocking between adjacent units. Thus the quadrants could easily be erected and stripped.

Form facing consisted of ¼-in. plywood backed by 1x4-in. vertical strips laid flat and set 1 in. apart. This was fastened to nine equally spaced horizontal 2x8-in. ribs or studs, each made up of four quarter-quadrant pieces cut to radius and scabbed together with 2x4's top and bottom. Vertical double 2x6-in. wales at the quarter points completed the form assembly. Five lines of Dayton ½-in. tie rods on a varying vertical spacing held the forms. Welded to the shaft's liner plates, the ties were located at quarter-quadrant points and at wracking strips between quadrants.



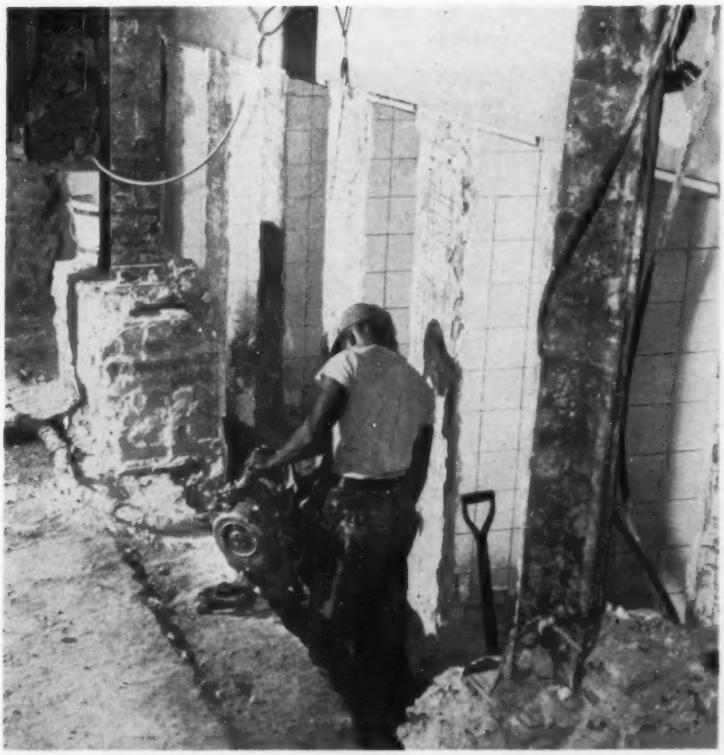
ON THE SURFACE—Before being lowered into shaft, form rests on shaft safety cover (steel bar joists decked with 2-in. planks). Paper protects form from weather.



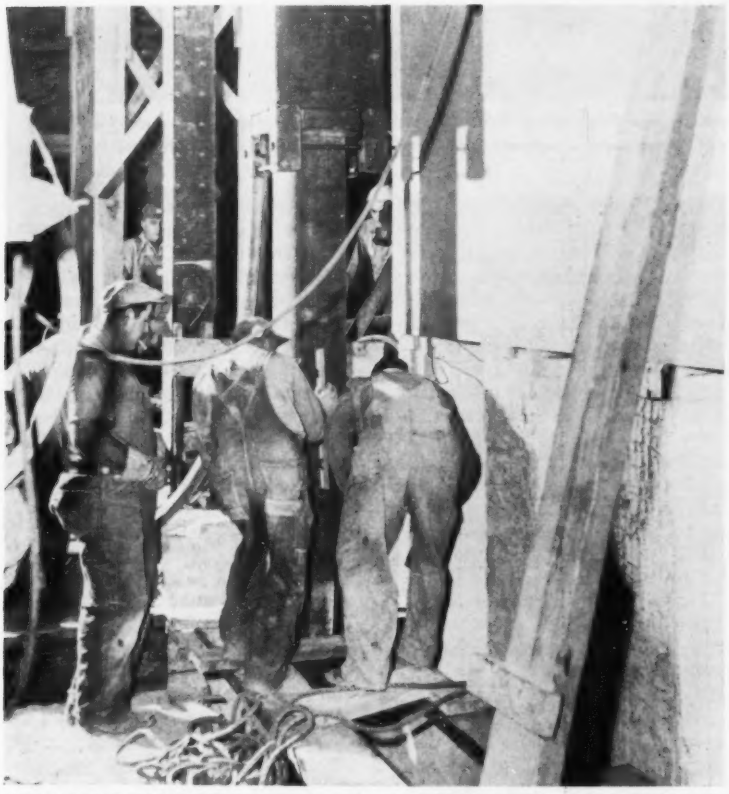
Jacks pick up the big vault and lower it in 9-in. steps to its new location in the basement. During the move, the load is shifted between the upper and lower carriage beams by alternately tightening and loosening each of the two sets of nuts on the threaded rods.

Hydraulic Jacks Lower Heavy Bank Vault to Basement

With an ingenious jacking system, a contractor picks up a 600-ton bank vault and lowers it 13 ft from the first floor to the basement through the center of an old bank building.



FIRST WORK—Workman with paving breaker digs trenches along the north and south sides of the vault, down to the concrete pile cap that supports the walls under the vault.



NEW FOUNDATION—Pile hammer, hung by chain fall to a cantilevered I-beam on the roof of the vault, drives piles through trenches for the new foundation under the vault.

LOWERING a two-story, 600-ton bank vault 13 ft from the first floor to the basement of a building sounds like a job that might cause trouble. But the work went off without a hitch under the direction of Spencer, White & Prentis, Inc., New York foundation and underpinning specialists.

The vault relocation is part of a program for modernizing the headquarters of the First National City Bank in the Wall Street section of New York City. Spencer, White & Prentis did the work as subcontractors to Starrett Brothers & Eken, New York.

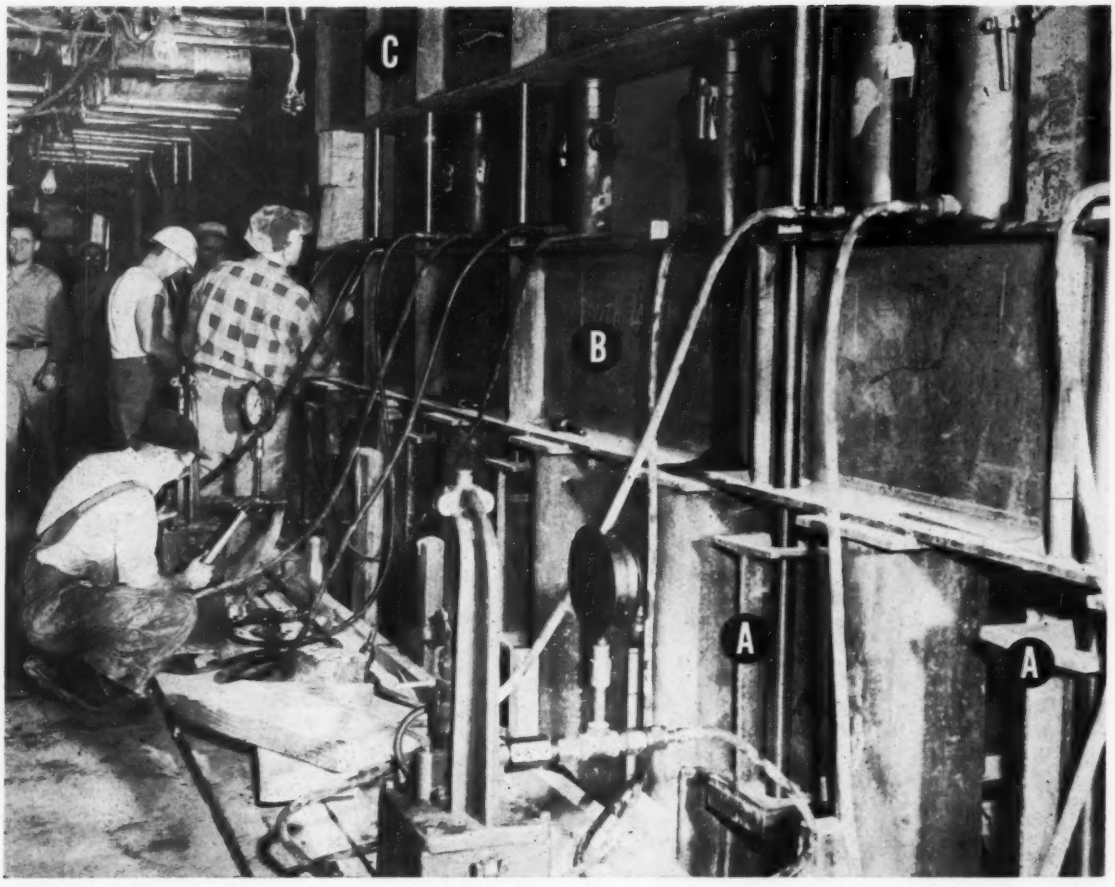
The job consisted of picking up and holding the vault temporarily, excavating under it, preparing a new pile foundation, lowering the massive weight, and, finally, grouting and concreting it in place.

The vault had been built in place by Carnegie Steel Corp. in 1906. It is made of 4-in. armor plate with 18 in. of powdered fireproof material sandwiched between the armor plate and outside shell of ½-in steel. It measures 24 ft, 9 in. across the front (north) and rear; each side is 22 ft, 8½ in.; and it is 17 ft, 3 in. high.

The bottom of the vault rested 2½ ft above the basement floor on eight parallel brick walls, almost 2 ft thick and on 3 ft centers. The walls ran north-south and extended down 7 ft into a pit below the vault. These walls formed narrow corridors that were illuminated and set with mirrors to serve as inspection areas.

Plans indicated that the floor of these corridors was a thin slab of concrete on a 6-ft earthfill that extended down to the same level as the bottoms of the walls. All eight walls and the fill between them was supposed to rest on a 3-ft-thick concrete cap encasing the tops of old wood piles. But the contractor discovered that the concrete cap on the piles was 7 ft thick and of extremely dense concrete.

Spencer, White & Prentis first dug down along the north and south ends of the pit to the bottom of the concrete pile cap. The work had to be accomplished with a minimum of interference with banking operations so the Thor paving breakers used on the day shift were enclosed in muffler bags. A Chicago Pneumatic 600-cfm compressor with an ex-



JACKING SET-UP—Tripper beams **(A)** are threaded through the walls and wedged up against the bottom of the vault. Lower carriage beam **(B)** rests on steel plates welded to tops of piles and supports jacks that thrust against upper carriage beam **(C)**.

tra muffler supplied air from the street outside.

Drilling men struck the top of the old wood piles 10 ft, 2 in. below the basement slab. Then the contractor brought in a McKiernan-Terry 9B3 hammer to drive 16 open-end pipe piles, one at each end of the eight brick supporting walls. The 12¾-in. O.D. piles were driven through the bottoms of the two trenches a distance of 24 ft to refusal on a dense hardpan that overlies bedrock.

The pile hammer was held by a chain fall fastened to an I-beam laid across the top of the vault and extended like an outrigger over the front and rear. To drive piles on the north side, the I-beam was pinned to the top of the vault on the south end so it could swing through a radius large enough to drive four piles. Then it was repositioned to drive the remaining four piles on the north end. The eight piles on the south end were driven in the same way.

Because of limited headroom, the piles were driven in short sections. Each successive piece was welded to the one ahead of it with connecting sleeves.

The piles were cleaned out and concreted, and their tops were cut off 6 in. above the bottom of the vault. The south row of piles was 17 in. outside the face of the vault; the north row was 20 in. from the vault to permit the vault door to clear the steel frame as the vault descended from the first floor to basement level.

Next, SW&P threaded eight tripper beams—each 24WF120—through the corridors and wedged them up against the bottom of the vault. The trippers were longer than the vault and extended out between the rows of newly placed piles at the north and south ends of the vault. The most easterly and westerly trippers were outside the side walls of the vault.

Then, the contractor placed a carriage beam—also 24WF120—across the tops of each row of piles and at right angles to the tripper beams. Carriage beams, too, were longer than the width of the vault and extended out beyond its east and west sides.

Before the installation, plate stiffeners ¾ in. thick had been welded to the web and both flanges of the carriage and tripper beams on both sides where they were to cross each other. And 3-in.-dia holes had been drilled through the top and bottom flanges of both carriage and tripper beams.

Two more carriage beams were positioned directly above the first two and separated from them by just enough timber cribbing to permit hydraulic jacks to be placed between them later.

Then workmen went to the top of the vault in the first floor mezzanine level of the bank and passed down threaded steel rods

FIRST MOVE—Jacks lift vault slightly, and lower set of nuts is tightened. Then jacks are retracted, transferring weight to the piles through the lower carriage beam.

Next 28 Watson-Stillman 40-ton hydraulic jacks were placed, fully retracted on top of the lower carriage beams—14 along the front of the vault and 14 along the rear. Jacks at opposite ends of each row were placed outside the endmost trippers.

The lower carriage beams, resting on the piles, were to remain stationary throughout the move; the upper set was movable to take the thrust of the jacks and permit the vault to descend a step at a time.

Workmen chopped holes in the east and west supporting walls directly under the sides of the vault, passed five short 8BP36 beams through the holes on each side, and welded them to the two outmost tripper beams. This formed grillages that would support the weight of the east and west walls of the vault.

Now SW&P was ready to transfer the weight of the vault to the piles. They tightened the top sets of nuts against the upper carriage beam and activated the jacks to lift the vault an inch or so. Then they tightened the lower set of nuts and retracted the jacks slowly. At this point the weight of the vault was carried through the trippers and rods into the lower beams.

continued on next page

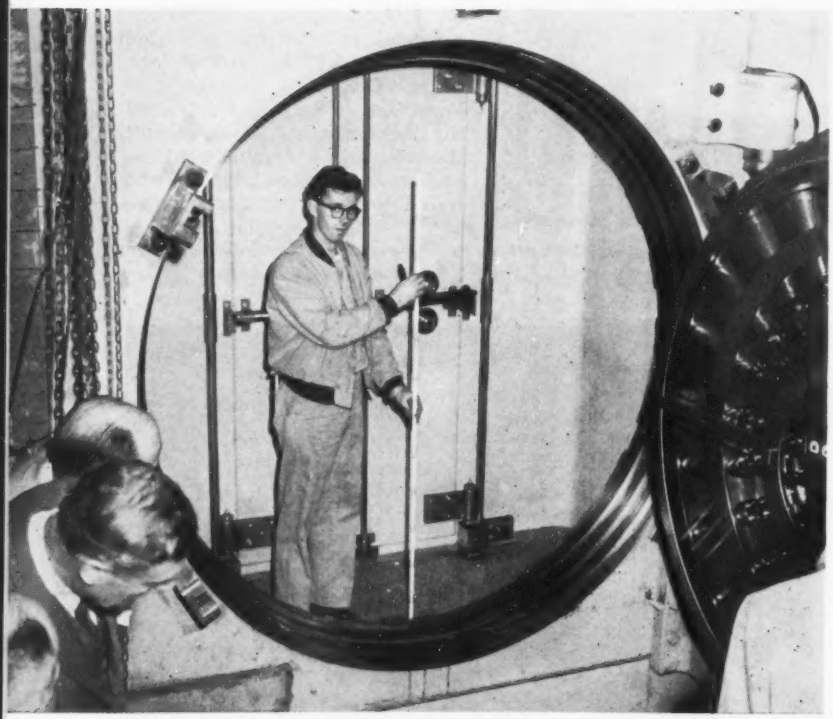
2½ in. in dia and 22 ft long. (A temporary wall had been built around the vault where it emerged through the first floor to prevent interference with banking operations. Lowering the rods was the only work performed at the upper levels; all other work was in the basement.)

The continuously threaded rods passed through the holes in the upper carriage beam, on through the lower carriage beam, then through the tripper beams. Finally they were threaded into 2½-in.-thick steel plates welded to the underside at the ends of each tripper. The ends of the rods were spot welded to these plates to prevent their backing off.

There were 32 rods in all—16 along the north end of the vault and 16 along the south end. There were two rods in each end of each tripper beam. Two nuts on each rod were brought up snug—one against the top of each carriage beam.

EXCAVATING—When the weight of the vault rests on the new piles, workmen break out the eight brick walls and the thick concrete pile cap that had supported the vault.

LOWERING THE VAULT—Men back off the upper sets of nuts, and jacks lift the upper beam through 10½ in. Then the top nuts are tightened, and jacks lift beam another ½ in. so lower sets of nuts can be backed off as jacks are retracted 10 in.



TRANSIT CHECK—Engineer and rod man check level of vault floor in its final position. Frequent checks during lowering prevented damage to delicately balanced vault doors.

HYDRAULIC JACKS LOWER HEAVY BANK VAULT . . . continued

Laborers with Ingersoll-Rand rock drills and Duncan Roc-Jaks then demolished the supporting walls and chopped out the thick concrete below them, along with the tops of the wood piles, to proper predetermined grade.

When the vault reached its new lower level, the plan was for the trippers to come to rest below it on specially designed brackets made from 12BP53 beams welded to the piles at proper location below the new bottom. So instead of excavating 2 ft or more below the proposed vault bottom and filling the area with concrete, SW&P saved time, money, and concrete by digging a series of eight trenches, one for each tripper beam. Then grout pipes were laid on the mounds of earth between these trenches with their outlet ends halfway up the row.

Jacking

Now the lowering operation was ready to go. The 28 jacks (using water, not oil) were divided into four systems of seven jacks each, one for each corner of the vault. Each system had a valve, and the four systems ran back to one major valve, then to waste. The four systems were activated simultaneously on each step of the lowering operation.

Each jack had a safety valve that remained open throughout the operation because nothing went wrong. But any one or any combination could have been closed off if necessary.

If the contractor had waited for the Watson-Stillman pump to lift the upper carriage beam and extend the jacks for each new bite, the job would have taken a long time because the pump is designed for little volume and lots

continued on page 92

Prather Brothers' Cat D7 Tractor opens up road to remove steel culvert before laying pipe.

ONE-MAN GANG-D7

Along highway's right of way, heavy stump with extensive root formation is 'dozed out.

The one-man gang next removes old steel culvert and smooths out bed for pipe.

Final step, before covering and cleaning up, is laying the concrete pipe itself.

Fast operator and versatile Cat D7 Tractor with matching No. 7S Bulldozer, gang up to handle a multiple-chore road job on Highway No. 22 between Webster and Keswick, Iowa. Contract called for 'dozing tree stumps, brush removal, cleaning and then laying 640 ft. of 24-in. pipe, 582 ft. of 30-in. pipe, 198 ft. of 36-in. pipe and 84 ft. of 42-in. pipe.

This is the fourth Caterpillar crawler Tractor that Prather Brothers, of Russell, Iowa, has purchased. "We just wouldn't consider any other make," says Jack Prather. "We like this machine's stability—its new oil clutch—its good vision, and hydraulic track adjusters!"

CAT track-type Tractors are rugged performers. The heavy-duty Caterpillar Engine lugs without fouling on the heaviest jobs, and its horsepower is honestly rated. The D7's operating weight of approximately 34,000 pounds is well balanced for maneuverability. The hydraulically boosted steering and quick-reversing transmission keep production high and are easy on the operator. For a practical demonstration of what these better-built machines can do, call your Caterpillar Dealer TODAY for a demonstration; he's as near as your phone.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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THE YELLOW MACHINES WITH LOW TOTAL COST

One of the eight Mack four-wheel dumpers with 22½ ton capacity operated by Goodfellow Bros., Inc., of Wenatchee, Washington. The Macks have proved so valuable that Goodfellow Bros. have four more on order. These heavy-duty haulers are taking on a . . .

punishing road job in

Even in temperatures ranging from —15° to 110°, through mud, extreme dust, snow and ice, and on grades of up to 23%—Goodfellow Bros. know that their Macks will perform efficiently, dependably . . . and profitably.

Under such grueling operating conditions, their Mack dumpers showed their capability on the 3,000,000-yard Rocky Reach Dam earth-moving project on the Columbia River. Then they double-proved it on the Snoqualmie Pass highway construction in Washington's rough mountain country.

Besides providing maximum payloads at minimum hauling costs, the Macks are particularly well accepted by Goodfellow Bros. drivers and shop personnel because of their handling ease, short turning radius and easy accessibility for servicing.

(Advertisement)

Dumping rock on a road-widening operation on Highway #10 in Washington's Cascade Mountains. Prior to this road job, Goodfellow's 22½ ton Macks were used in the 3,000,000 yd. excavation and backfill for the Rocky Reach Dam near Wenatchee, Washington.

Snoqualmie Pass

There is a Mack tailored to your construction needs that will provide large-capacity payloads at minimum unit cost. Let your Mack representative show you on-the-job performance proof that—under today's conditions—you can't afford *not* to operate Macks! Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd.

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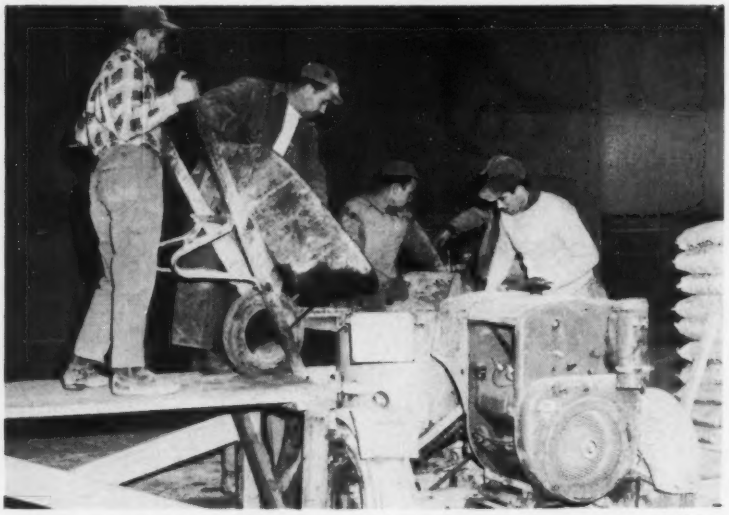
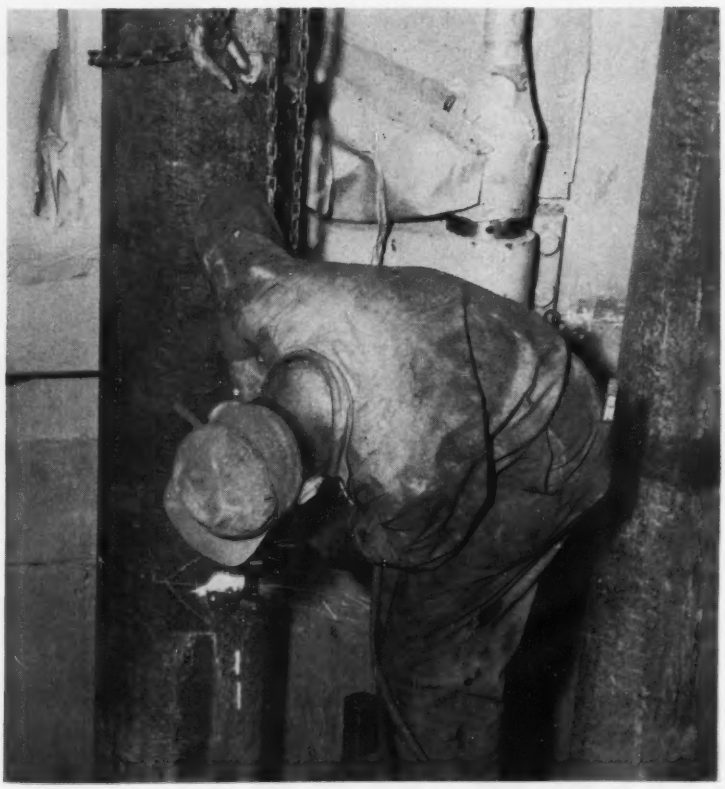


GROUTING—Double-drum Colcrete mixer and pump on the street outside the building deliver grout to fill in the area under the vault. Grout pipes remained embedded.



CUTTING OFF PILES—With rods, nuts, beams, and jacks dismantled, workman burns off threaded rods and concrete-filled piles just below level of new basement floor.

of pressure. Instead, they merely used city water to lift the upper beam and extend the jacks—a case of not much pressure but plenty of volume. The city water lifted the upper beam each time in little more than a minute or two.

With a man assigned to each set of four nuts and rods, the upper set was backed off, and the jacks lifted the upper beam through 10½ in. of their 11-in. thrust. Then the men tightened the top nuts, and the jacks extended the final ½ in. This permitted hand-loosening of the lower set. As the jacks retracted slowly, lowering the 600-ton weight, the men slowly backed off the lower set of nuts, taking care not to let them get more than ¼ in. above the lower carriage beam in order to keep everything in control. When 10 in. of the 11-in. thrust had been retracted, the lower nuts were tightened, putting the weight back on the lower beam. The vault had descended its first 9 in.

This process was repeated slowly with constant checks by transits on all vault walls because the heavy but delicately balanced doors could not be permitted to go out of level.

The entire lowering operation took 8 hr—to the halfway point in 4 hr on the first day and the rest of the way the following morning. Then, with the tripper beams resting on their brackets, the threaded rods were out of tension, and the vault was resting permanently on the piles.

To fill in the area below the vault, grout was forced through the piles from a Colcrete double-drum 4-cu-ft mixer and pump located outside the bank. As soon as the lowering had been completed, gravel had been dropped down between the piles in the north and south trenches and pushed with rods as far as possible under the vault, surrounding the ends of the trippers. The grout ran out through this gravel and welled up on all four sides of the big vault.

Finally, the steel frame, jacks, and other equipment was dismantled, the piles were cut off just below the level of the new finished basement floor, and the trenches surrounding the vault were filled with stone concrete.

Harry T. Immerman, chief engineer for Spencer, White & Prentis, designed the lowering scheme. Howard Gould was project manager, and Harry Armstrong, Jr., was job superintendent.

For Starrett Brothers & Eken, Edward J. Fee is general superintendent, and Arnold C. Warmolts is project manager. McKim, Mead & White are architects for the overall modernization.

ENGINEER'S FIELD REPORT

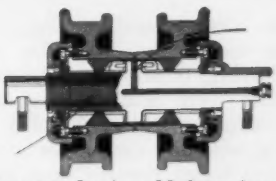
PRODUCT	RPM TRACTOR ROLLER LUBRICANT
FIRM	THOS. SCALZO CO. Seattle, Washington

Just 3 new track rollers in 4 years' tough service

Granite Boulders put a real strain on track rollers, but this Allis-Chalmers HD20, using RPM Tractor Roller Lubricant, A/C Type, has replaced only three rollers in four years of working under such punishing conditions. Tractor is operated by Thos. Scalzo Co., specialists in earth-moving projects. RPM Tractor Roller Lubricant gives this operator an average life of 3,000 hours for track rollers on equipment in heavy-duty service. After 3,000 hours, rollers are switched to equipment in lighter duty service.

Pulling a Grid Roller, this Caterpillar D8 tractor is another of Scalzo Co.'s 14-tractor fleet—all of which use RPM Tractor Roller Lubricant. Says Vic Scalzo, "In spite of rough service under all kinds of conditions, in 15 years we have never had to replace a track roller because of lubricant failure. Our on-the-job experience and our service records prove that RPM Tractor Roller Lubricant has been doing a good job for us since we started using it in 1941."

How RPM Tractor Roller Lubricants resist wear in toughest service



- Flow evenly to all bearing surfaces—retard rusting.
- Chemical agents maintain tough lubricating film and stability.
- Additive materials keep lubricant on bearings, resist leakage, helps form protective seal for bearings.
- Lubricants meet specifications of all tractor manufacturers.

For More Information about this or any other petroleum product, or the name of your nearest distributor, write or call any of the companies below.

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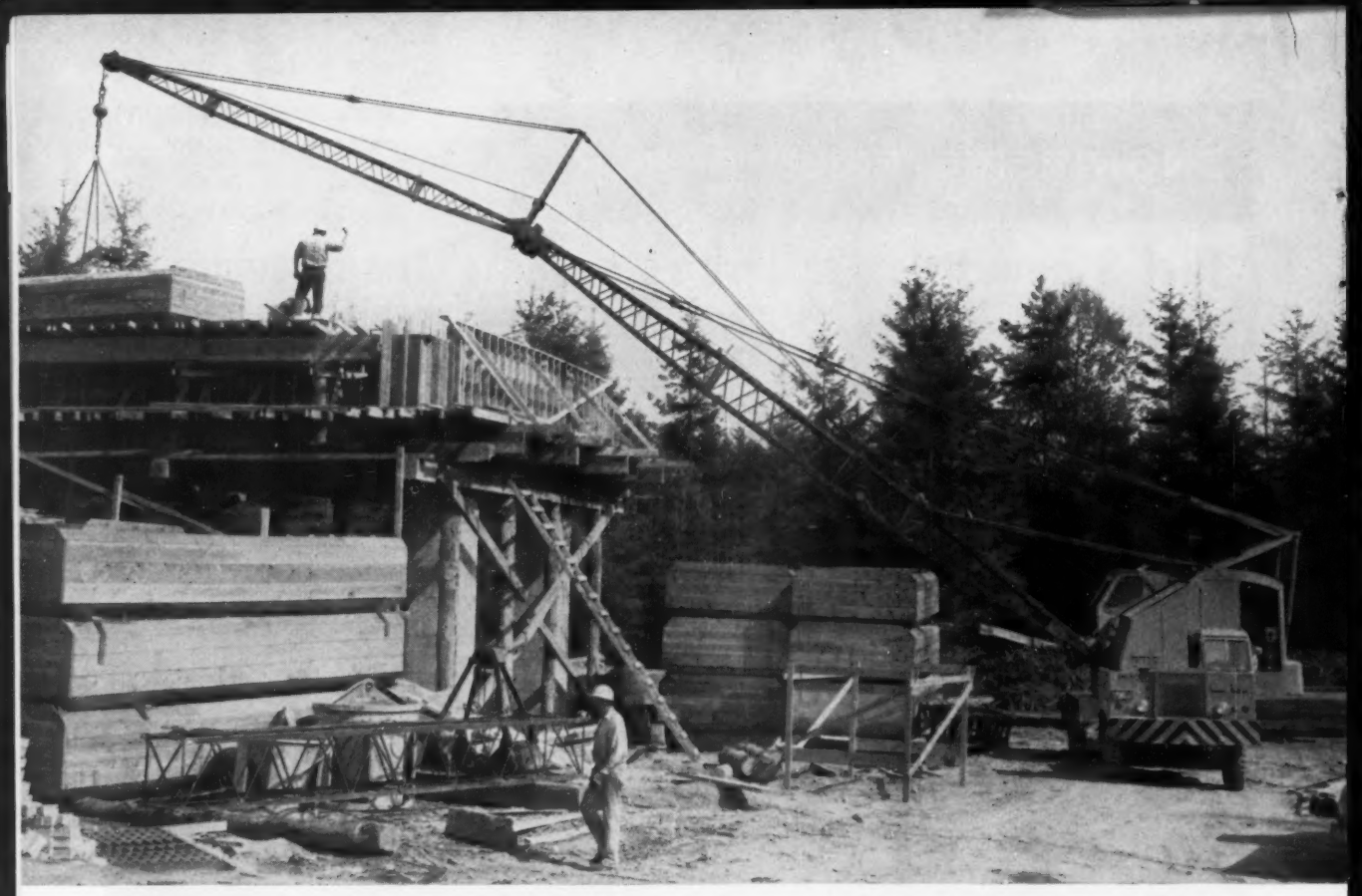

REACHING UP to an overpass that will span the Olympia Freeway, this American 25-ton Truck Crane spots a form "on deck". Precision control of boom and load means faster, safer load handling—more productive time. Note the exceptional stability of this 300 Series machine working over the side without outriggers.

AMERICAN'S LOW BOOM STABILITY PROVED ON OVERPASS PROJECT!

At the eastern end of the Olympia Freeway, a bridge was constructed over 4-lane Highway 99. Pile driving, falsework erection, form and concrete handling were done from highway shoulders to avoid slowing traffic. John E. Alexander, Inc. of Seattle, who had the bridge contract, put an American 300 Series Truck Crane, with 65 feet of boom, 30 feet of jib, on this long reach job.

Working the crane from the shoulders meant frequent low boom, long radius operations. The American's fast boom action—up and down—provided important time and money saving advantages on this job that was completed ten weeks ahead of schedule!

"Our American Truck Crane's ability to handle a full one cubic yard concrete bucket at a radius up to 65 feet has been a welcome addition to our profit margin . . . it's been a significant factor in our ability to handle more and larger contracts," reports John Alexander. Operator Sandy Gorsuch reports, "A good crane—handy for boom changing!"

American's job-engineered cranes perform difficult jobs fast and with profitable efficiency—*ask American owners.* Low boom operations are routine for unusually stable Americans, and booming is fast, safe—because an over-running sprag clutch gives absolute control all the time—*ask American operators.* There's a complete line of American Cranes and Excavators—in capacities from 12½ tons, ½-yard—ready to serve you. Call your nearby American Distributor for complete information on this versatile, dependable line!

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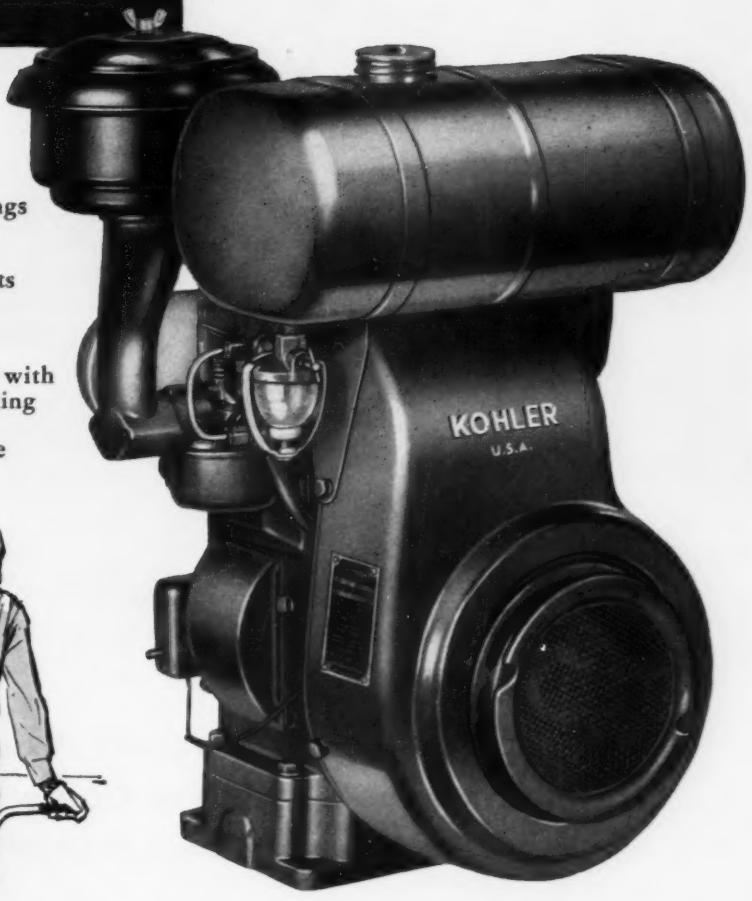

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H & B Mobile Plants are available in three sizes: M-60 (160 to 225 tons per hour), M-40 (120 to 140 tons per hour) and M-20 (40 to 60 tons per hour). Bulletin M-57 will be sent on request.

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"We have found that we can reduce our mixing time by 15 seconds per batch, which is a great advantage over the other two plants we operate."

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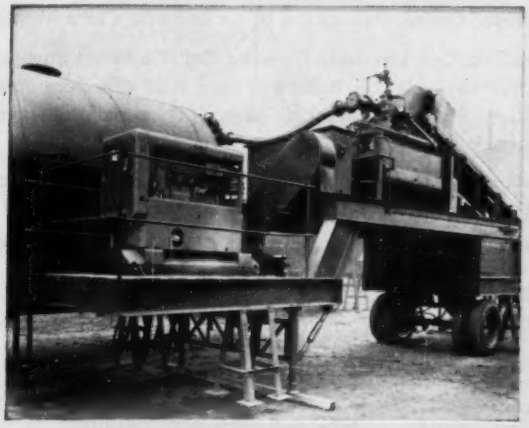

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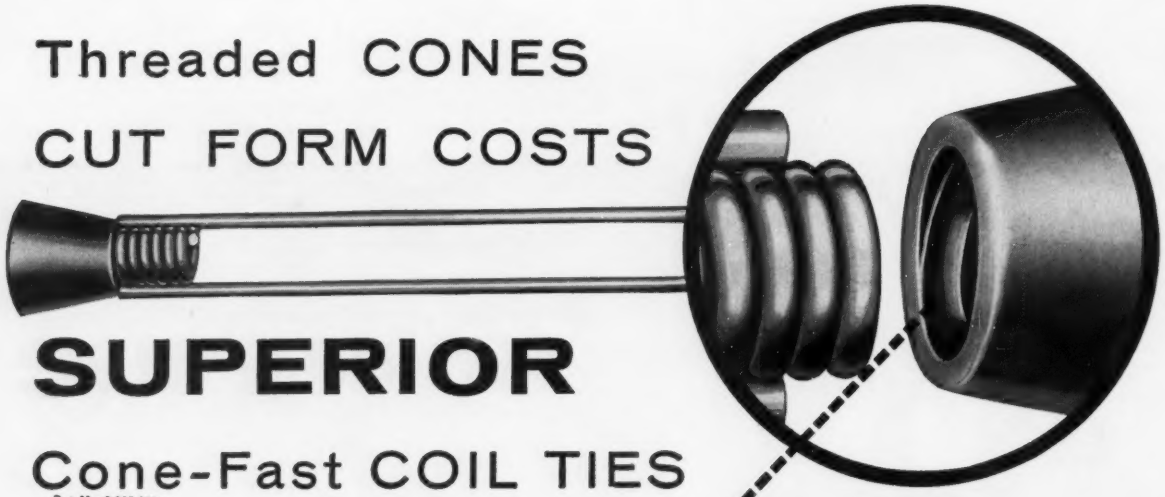

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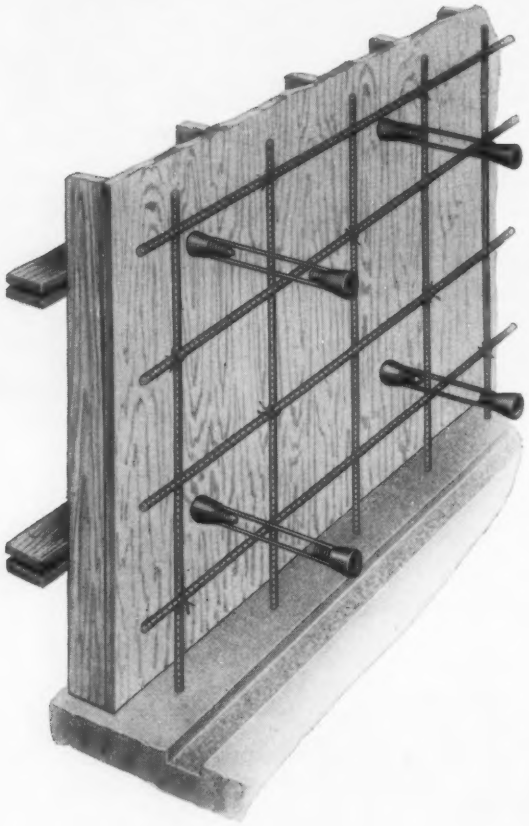

Patented Threaded Cone Permits Extra Fast Erection of Forms!

Form erection crews can maintain extra fast schedules when using the Superior *Cone-Fast* Coil Tie Assembly because of a patented threaded feature whereby less than 2 turns of the Cone hold it securely to the Coil Tie. Designed especially for jobs where large panel forms are used for thin walls that do not permit a man inside forms, these *Threaded* Cones cannot be knocked off the Coil Ties when the opposing form is being applied. Here's an additional advantage . . . units may be bench assembled with the assurance that they will arrive at the destination point intact! Stripping is easier too . . . as the Threaded Coil Cones back out of the wall with a cone wrench.

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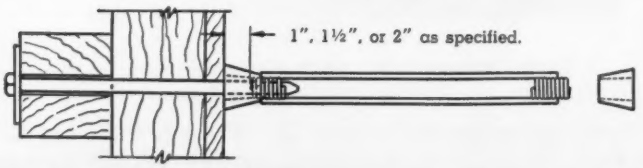
May be used with wood, combination wood and steel, and all steel form work for bridge piers and abutments, retaining walls, filtration and sewage disposal plants, and other engineering projects. Illustration above shows assemblies in place prior to erection of opposite form.



SUPERIOR

PAST AND PRESENT—New AGC president, Fred W. Heldenfels, Jr., of Corpus Christi, Tex. (left), receives token of his office from his predecessor, Lester C. Rogers of Chicago.

Labor Outlines New Code to AGC

CONTRACTORS can look forward to an expanding market for new construction this year—even in the face of a continued decline in most other sections of the American economy.

Addressing the 39th annual convention of the Associated General Contractors at Dallas, Tex., last month, James D. Marshall, executive director of the association, told the delegates they have "a potential market" of $68 billion this year, including new construction and maintenance and repair work. This represents a $3 billion increase over 1957.

But even as the industry confidently enters its 13th consecutive year of record activity, business failures among contractors continue to grow at an alarming rate, Marshall said.

"Today, the problems of being successful are multiplying with the complexities and uncertainties involved in such matters as labor - management bargaining, legislation, industry relations, and taxation and depreciation," Marshall said.

It was to these subjects that the delegates devoted most of their attention.

They heard their national president and the president of the AFL-CIO's Building and Construction Trades Department swap views on labor-management relations.

In a formal statement, Lester C. Rogers, the AGC's 1957 president, "demanded" that the unions begin to give "a full day's work in return for a full day's pay."

The general public has a big stake in the performance of the construction industry, he said, and labor-management problems were never more critical than they are now "when construction is one of the main props in the national economy."

He called upon the AFL-CIO to eliminate "featherbedding and make-work" practices, which, he said, "are beneath the innate dignity of the American workman."

Richard J. Gray, president of the Building and Construction Trades Department, which represents 3,000,000 men in 19 national and international unions, addressed the convention on the day that Rogers' statement was issued.

In reply, he read "a set of principles" that has been adopted by his organization. "We realize the many problems that confront the union contractor in a highly competitive field such as ours," he said. "It is for that reason that we thought it necessary to bring about this declaration of policy . . . This is our answer to you." His statement:

1. The selection of the craft foremen or craft general foremen . . . shall be entirely the responsibility of the employer.

2. The welding torch is a tool of the trade having jurisdiction over the work being welded. Craftsmen using the welding torch shall perform any of the work of their trade and shall work under the supervision of the craft foreman.

3. Workmen shall be at their regular place of work at the starting time and shall remain at their place of work until the regular quitting time.

4. There shall be no limit on production of workmen nor restriction on the full use of proper tools or equipment, and there shall not be any piece work.

5. Payment of excessive daily travel allowances or subsistence shall be discouraged.

6. Jurisdictional disputes shall be settled in accordance with procedures established by the Building Trades Department of the AFL-CIO . . . without interruption of work or delay to the job.

7. So-called area practices, not a part of collective bargaining agreements, shall not be recognized nor should they be enforced.

8. Slowdowns, forcing of overtime, spread work tactics, standby crews, and featherbedding practices have been and are condemned.

9. Stewards shall be qualified workmen performing work of their craft. There shall be no non-working stewards.

10. There shall be no strikes, work stoppages or lockouts during the processing of any grievances or disputes in accordance with the manner prescribed in the local or national agreement.

Depreciation Relief Seen

Another field of vital importance to the delegates—depreciation schedules—was discussed by a prominent Washington at-

continued on page 102

BIG MU

These new Chevrolet heavyweights are true big-tonnage units . . . trucks built from stem to stern to save you time and money on *big* jobs. Here's all the proof you need!

Chevrolet heavy-duty models for '58 are "big truck" all the way—big-muscled and tough as they come with the industry's best known big-truck components. They're ready to move mountainous payloads with G.V.W.'s that go all the way up to 36,000 lbs. They're ready to keep you going and saving with powerful, high-torque V8's . . . durable Eaton and Timken axles . . . rugged New Process, Spicer and Powermatic transmissions . . . big, safe Hydrovac, Air-Hydraulic or Full-Air brakes . . . sturdy cast spoke or disc wheels . . . mighty Triple-Torque tandems . . . all available either as standard equipment or as extra-cost options.

Famous work-proved big-truck components such as these (and there are *many* more) are reasons why you can count on the heavyweight Chevrolet of your choice to *stay* on your job and *save* on your job! Look 'em over at your Chevrolet dealer's. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

YOUR BEST BET'S CHEVY IF YOUR HAULING JOB IS BIG!

CHEVROLET **NEW CHEVROLET**

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TO CUT CONSTRUCTION COSTS!

1958 Chevrolet heavyweights with G.V.W.'s up to 36,000 lbs. (G.C.W.'s up to 50,000 lbs.) and the toughest big-truck components in the business!

BIG MUSCLE (AND HUSTLE) UNDER THE HOOD!

Revolutionary Workmaster V8, standard in Series 90 and 100. This all-new engine puts out 230 h.p. to reduce running time, 335 ft.-lbs. of torque to pull you through the tough spots . . . yet it maintains a low r.p.m. level, a moderate engine speed. This low r.p.m. factor spells *economy*—lower day-to-day costs than you've ever known before in big-tonnage hauling. It's the result of Wedge-Head design, a power and economy producing type of construction no other truck engine offers. And those rugged heavy-duty features listed at the right help provide matchless big-truck performance, too!

No other truck engine at any price gives you this complete lineup of top-quality heavy-duty features:

Valve-in-head design • Hydraulic valve lifters • Sodium-cooled exhaust valves • Positive type exhaust valve rotators • Hard-faced exhaust valves • Hardened exhaust valve seats • Induction hardened crankshaft • Fully machined combustion chamber • Chrome-plated top piston ring Moraine 400 extreme-duty bearings • Full-Flow oil filter Oil bath air cleaner • Positive crank-case ventilation • Centrifugal-vacuum type governor • Heavy-duty 5-blade fan

TASK · FORCE 58 TRUCKS

HEAVY DIVISION—Charles L. Harney of San Francisco, Calif., receives congratulations from Robert M. Hoover of Kansas City, Mo., after being elected chairman. Heavy and railroad contractors elected Howard H. Sturdy of Pittsburgh, Pa., as vice chairman.

HIGHWAY DIVISION—Max C. Harrison of Pittsburgh, Pa. (left), is chairman. Others in photo are (from left to right): W. Ray Rogers of Portland, Ore., 1957 chairman; J. P. Gibbons of Salt Lake City, Utah, vice chairman; and James Sprouse, division manager.

BUILDING DIVISION—Ira H. Hardin of Atlanta, Ga. (left), is the new chairman of the building contractors division. Vice chairman is Robert W. Long of Kansas City, Mo.

torney. The lawyer, Travis Brown, held out hope that renewed government interest in depreciation policies might lead to rulings that would offer the industry an important form of tax relief. "Advancing price levels during recent years have made depreciation deductions wholly inadequate to pay for the purchase of necessary replacement equipment," the attorney said.

"The industry still is suffering from depreciation schedules based on depression years," he said. "In that period industry was unable to replace equipment on a normal schedule. The long life attributed to equipment is no longer realistic."

A more equitable depreciation schedule, he said, "will have a direct bearing on the contractor's ability to carry out the federal-aid highway program economically."

"Contractors can do the job provided they can acquire and maintain the most efficient construction equipment available," he said. "Only through the use of such equipment can bid prices be kept low, and, in fact, can the contractor survive. Depreciable life of equipment must be shortened to allow contractors to recover more rapidly their equipment costs and to aid them in repurchasing the necessary replacements."

Managers Optimistic

Optimism keynoted the annual reports presented to the convention by the managers of the three divisions that make up the AGC.

The value of contract awards for all types of highway work increased more than 20% last year, according to James M. Sprouse, manager of the Highway Contractors Division. He predicted a rise of about 30% in the volume of work on federal-aid highways before the end of the year.

"States presently progressing satisfactorily with both interstate and ABC work will maintain or improve this rate of work," Sprouse said. "More important, in those states where interstate projects have not yet been awarded at a satisfactory rate, there is every indication that the volume of awards will increase.

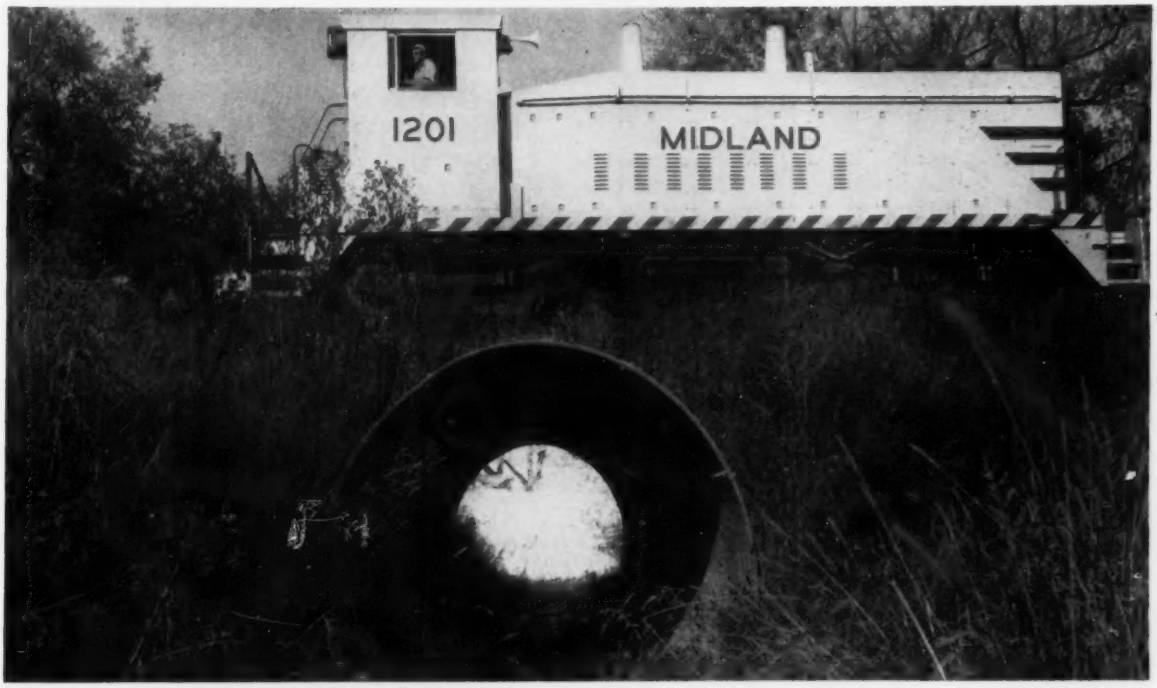
Sprouse said that a state-by-state survey of contractor capacity recently completed by the highway division shows "most positively" that they can handle the work increase easily.

One of the most encouraging reports was delivered by Donald A. Buzzell, manager of the AGC's Heavy Construction and Railroad Contractors Division. Public works construction last year totaled nearly $14 billion, a 9% increase over the previous year, he said, and a substantial backlog of public works still exists.

Another reason for optimism, he said, is that federal contract financing difficulties, which occurred in 1957, "have now been somewhat alleviated."

continued on page 107

"Armco Drainage Structures help us speed up installation"



Under this industrial railroad to the Midland Collieries, Inc., is an Armco MULTI-PLATE Pipe, 102 inches in diameter. Many other Armco Drainage Structures are installed under this same line.

So said Mr. H. W. Hartmann, Vice President of McDougal-Hartmann Co., well-known engineers and contractors of Peoria, Illinois. He was referring to his company's installation of Armco Corrugated Metal Drainage Structures on a nine-mile railroad line for Midland Collieries, Inc., of Victoria, Illinois.

Time was an important factor in this job because the coal corporation wanted to use the railroad before winter set in. Not only did the contractor find the Armco Structures time saving, but Mr. Hartmann also said, "Armco Structures were more economical to install."

The drainage project—involving Armco MULTI-PLATE® Pipe and Pipe-Arch—included a total of 8 structures; diameters (or equivalent) range from 78 to 168 inches, and have a total length of 566 feet.

• • •

Corrugated Metal Drainage Structures comprise just one group of the more than 30 Armco products. They are available from hundreds of experienced Armco salesmen located in more than 175 cities, and in close proximity to one of the more than 50 Armco fabricating plants. Use coupon for more data. Armco Drainage & Metal Products, Inc., 3088 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

ARMCO CONSTRUCTION PRODUCTS

Here is another Armco MULTI-PLATE Pipe, 168 inches in diameter, in final stages of assembly, for installation under the same railroad line.

FREE **POCKET-SIZE INSTALLATION MANUAL**

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☐ Send me my copy of the free installation manual on Armco Corrugated Metal Drainage Structures.

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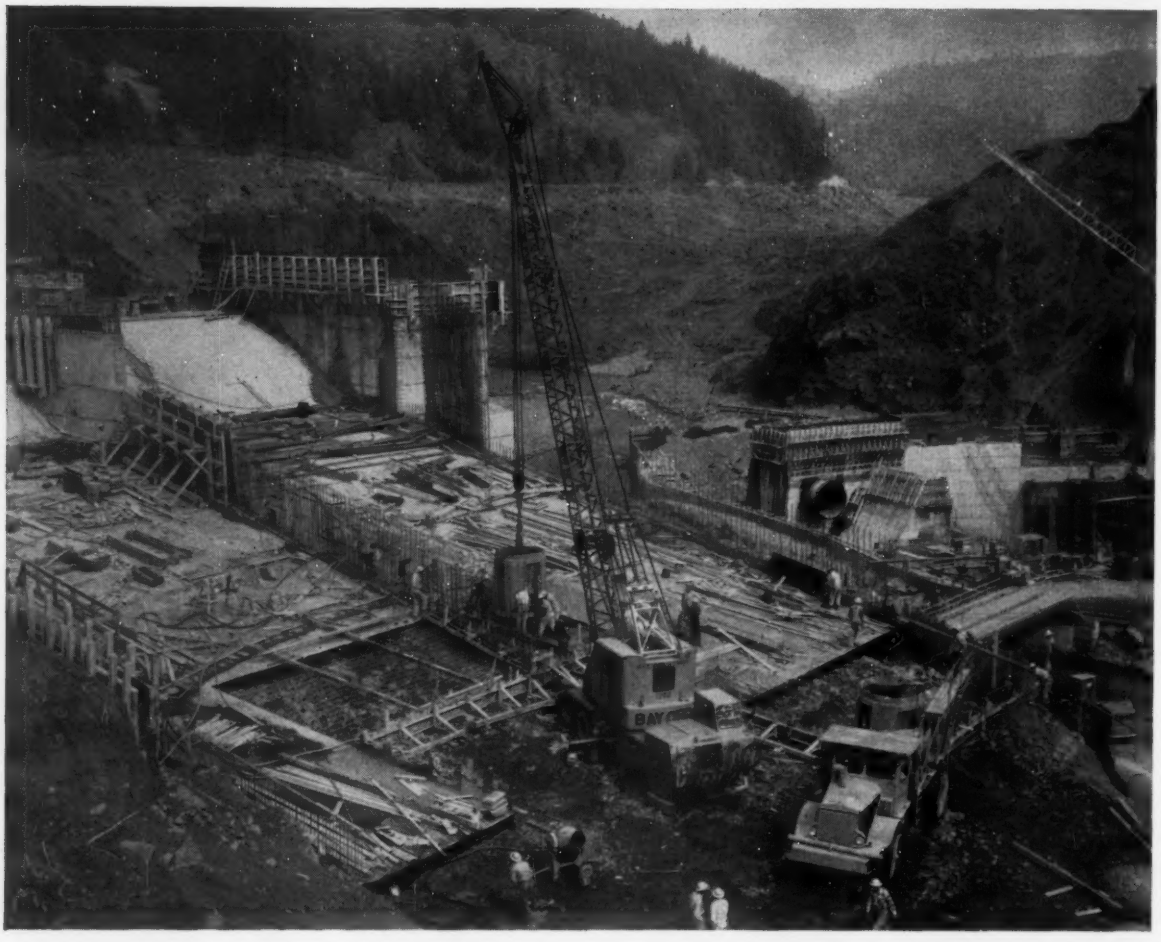

How Guy F. Atkinson Company places 40 yards of concrete per hour with BAY CITY CRANEMOBILE®

On the north fork of the Clackamas River near Estacada, Ore., Guy F. Atkinson Company is constructing a hydroelectric dam for the Portland General Electric Company of Portland, Oregon.

The dam, a thin-arch type 185 feet high, contains approximately 68,000 cubic yards of concrete. For the immense job of concrete placement, Atkinson is using a 25-ton capacity BAY CITY CraneMobile with a 75-foot boom and jib. Lifting a full two-yard bucket . . . placing the concrete . . . and returning the empty bucket to a waiting truck at the rate of one bucket every 3 minutes . . . this rugged BAY CITY averages 40 yards of concrete an hour.

You, too, can get this kind of outstanding performance and dependability . . . plus mobility over rough terrain . . . with a CraneMobile. See your nearest BAY CITY dealer for all the facts or write us for latest catalogs.

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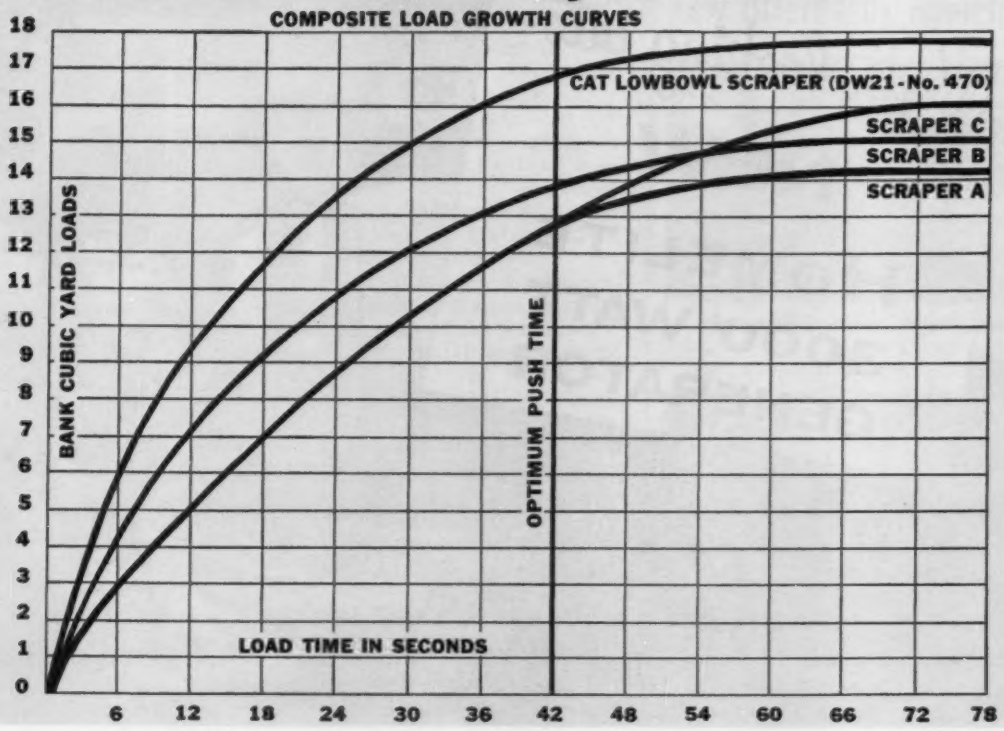
CAT LOWBOWL SCRAPER LOADS BEST IN MISSOURI ON-THE-JOB TEST!


COMPOSITE LOAD GROWTH CURVES
CAT LOWBOWL SCRAPER (DW21-No. 470)
SCRAPER C
SCRAPER B
SCRAPER A
BANK CUBIC YARD LOADS
OPTIMUM PUSH TIME
LOAD TIME IN SECONDS
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
6 12 18 24 30 36 42 48 54 60 66 72 78

LOCATION OF JOB: Mark Twain Expressway west of McKelvey Road, St. Louis, Missouri.

SCRAPERS IN TEST	**Struck capacity**
Scraper A	15 cu. yd.
Scraper B	18 cu. yd.
Scraper C	16 cu. yd.
Cat LOWBOWL Scraper	18 cu. yd.

All manufacturers whose units were tested had representatives present to check weights and load time.

CONDITIONS: Material—wet yellow clay weighing 3,300 pounds per cu. yd. by density test. **Loading conditions**—cut was interspersed with soft, saturated mud pockets.

PROCEDURE: Each scraper was pushloaded on a slight upgrade by the same pusher. The pusher was timed and waved off at fixed periods, with the first wave-off at 30 seconds. Then the load in the scraper was weighed and the distance pushed measured. The wave-off periods were increased in 12-second intervals from 30 seconds to 78 seconds, with loads weighed and distances measured at each wave-off.

RESULTS: This chart of composite load growth curves reveals the superior "loadability" of the Cat DW21-No. 470 LOWBOWL Scraper. In the first 30 seconds of pushing, its load growth was extremely rapid. Load after load, its bowl filled evenly and completely. Most economical load time proved between 42 and 64 seconds, with the DW21-No. 470 LOWBOWL Scraper averaging 17.4 bank cu. yd. a load. Note that during the same time Scraper B (also 18 cu. yd. struck capacity) averaged only 15.1 bank cu. yd.—a clean-cut margin of 2.3 extra yards a load for the DW21-No. 470.

On the job, where performance separates the men from the boys, test after test proves that Caterpillar LOWBOWL Scrapers handle material at *lower cost per yard* than scrapers of other makes, regardless of capacity. One big reason is the LOWBOWL'S superior loading characteristics, charted above. According to the facts and figures, not "seat of the pants" judgment, LOWBOWL design pays off in more profitable production. Want to see these facts and figures? Ask your Caterpillar Dealer to show you reports of jobs in your area. See for yourself!

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

The Cat DW21-No. 470 LOWBOWL Scraper has a capacity of 18 cu. yd. struck and 25 cu. yd. heaped. Its exclusive LOWBOWL design loads more material faster because of less loading resistance.

CATERPILLAR

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USE CAT LOWBOWL SCRAPERS FOR LOWER COST PER YARD

USED BY MEN WHO BUY EQUIPMENT FOR WHAT IT SAVES

More Power...Easier Operation...Less Maintenance

We put it squarely up to builders and contractors all over the country. Homelite engineers wanted to know what you need in a lightweight gasoline engine driven generator. And here's the Homelite solution . . . a brand-new unit that weighs only 140 pounds and gives you full 3000 watts. It has the extra power to run extra tools and floodlights. And you don't have to operate rheostats or other controls. The voltage is automatically controlled within four per cent from no load to full load. This new Homelite model 8A is completely free from trouble makers. No DC brushes. No commutator. No DC windings on armature. See it in action, right away. Two models are available . . . 115 volt and 115/230 volt, both 60 cycle, AC.

Homelite factory branches are located throughout the country. Your nearest one is as close as your phone. Call them or write for convincing demonstration or rapid service in any way.

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GENERATORS PUMPS • CHAIN SAWS BLOWERS

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AGC CONVENTION . . .
continued

Building construction volume is expected to increase about 5% this year, according to Welton A. Snow, manager of the Building Contractors Division. The biggest percentage increase is expected to be for public housing, which is expected to reach $850 million as compared to last year's $505 million. The biggest decrease will be for industrial construction, which is expected to fall off because of the decline in capital outlay by manufacturing companies. Snow said that industrial construction will be down 10% from last year's $3.2 billion.

Public non-residential building will rise about 5%, and home building is expecting a 6% increase, he said. Private non-residential building will remain at about 1957's level of $3.6 billion.

Government officials in charge of federal public works and military construction generally tended to back up the AGC's encouraging estimates of 1958 work. But words of caution were expressed by some department representatives who maintained a "wait - and - see" attitude while awaiting the disposition of budget requests for the 1958-59 fiscal year. Generally they agreed that military spending will increase sharply, while new public works will depend on action by Congress.

Bertram D. Tallamy, Federal Highway Administrator, said the federal highway program is "right on schedule," but he admitted that there have been lags in some states.

The administrator predicted that construction contracts "of all sizes and types" totaling nearly $2.8 billion will be awarded this year. This would bring the total value of contracts awarded under the federal-aid highway bill to $3.7 billion by late summer.

The Air Force's Director of Installations said that his agency's construction awards this year "will be about double those of any year since World War II."

"I can see more than $2 billion in awards for new construction this year," Maj. Gen. A. M. Minton said. He added: "It even might run much higher than that, considering our housing program It might reach $3 billion.

Minton said the development of missile bases, the dispersal of airfields, and a building program for housing military personnel will keep Air Force construction requirements high.

Major General W. K. Wilson, Jr., Deputy Chief of Engineers for Construction, Corps of Engineers, told the delegates that "we meet at a turning point in what has been a rugged year in the Army's construction program."

General Wilson said that the civil works program, which is normally more stable than military construction, "has been pretty bady confused" in the past year because of fluctuations in the funds available.

"It has now been determined that sufficient funds can be made available to continue a minimum program and that no contracts will be stopped," he said. "But the new budget provides only money to continue work already under way. It makes no provisions for new starts. And going projects will be continued only at a minimum rate of progress."

But for military construction, Gen. Wilson said, "the period of limitation is technically over. Now we face problems of exactly the other kind . . . A year's load of business will be largely crammed into this spring period. We had to call upon your understanding during the period of stoppages; we now rely on you to help us fulfill the tasks of the unusually active period ahead."

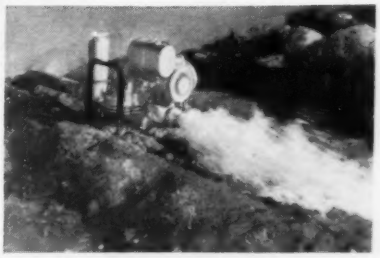
The Navy sees 1958 as a "time of austerity in the midst of a big workload," according to Rear Admiral E. J. Peltier, Chief of the Navy's Bureau of Yards and Docks. "It is a time for efficient construction to get the most for the construction dollar, and, above all, it is a time for ingenuity in finding areas in which to cut costs."

He said it is still too early to determine the extent of the Navy's program for 1958, "but it is reasonable to guess that the new military concepts will bring about . . . an expanded construction program."

Another federal agency facing budget problems is the Bureau of Reclamation. The Bureau will spend about $180 million for construction during this fiscal year, and it has asked for $198 million for the fiscal year starting June 1.

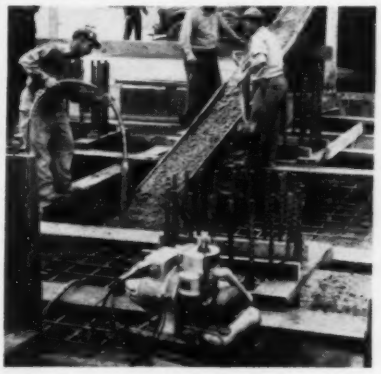
But W. A. Dexheimer, Commissioner of the Bureau, said that because of the tight national budget situation, "we do not now anticipate the start of any major new projects during the coming fiscal year."

Full Line of Carryable Construction Equipment Now Offered by Homelite



Carryable Diaphragm Pump . . . Weight: 120 lbs. Capacity: 5000 gph. Size: 3". Centrifugal Pumps: 1½" – 3" also available.

Chain Saws For Every Job . . . Now you can choose from a full line of lightweight, powerful Homelite chain saws. From 3½ to 7 horsepower . . . 19 to 29 pounds. Brush cutting and clearing attachments are available to handle all your cutting jobs.



One-Man Electric Vibrators . . . High-cycle and 110 volt AC-DC motor-in-head models. Electric flexible-shaft-driven model also available.

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Famous Quality Products such as Delvac Oils, New Mobilube GX multipurpose-type Gear Lubricant and Mobilgrease.

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Why not ask your Mobil representative to show you how this marvelous system can help you?

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1. Record Folder—provides identifying data for each piece of equipment, holds equipment records.
2. Operator's Recommendation Chart—lists the correct lubrication recommendations for each piece of equipment.
3. Weekly Service & Inspection Report—an up-to-date record of mechanical condition of equipment, work to be done or completed.
4. Delivery Ticket—lists petroleum supplies delivered to equipment on the job.
5. "Squawk" Sheet—used by equipment operator to point out trouble spots that need attention.

Tune in "TRACKDOWN" every week, CBS-TV. See your local paper for time and station.

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Correct Lubrication

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(Advertisement)

How millions of dollars can be saved annually on the Highway Program

A recent survey by *Engineering News-Record* shows that in many states progress payments to highway contractors, supposedly paid in from 2 to 23 days, are actually held for as high as 12 to 150 days. Retainages, claimed by highway departments to be paid in from 2 to 52 weeks, are actually held by some highway departments for as high as 8 to 130 weeks according to contractor reports.

"Private retainage" due to intentionally underestimating quantities on progress payments, or undervaluing partial completion of an operation, further aggravate the situation and further reduce the contractors' working capital.

All payment-delays *minimize* competitive bidding . . . *require increases* in bid prices to cover financing costs . . . *penalize modernization* of contractors' equipment . . . and *limit hiring* of adequate manpower. All of these delay completion and increase costs of the roadbuilding program.

Here are suggestions made by highway contractors to *Engineering News-Record* for remedying this slow-pay problem.

1. **Set up arbitration boards to settle disputes promptly between the contractors and the states. Litigation, so costly to both state and contractor in time and money, can be avoided.**
2. **Make the bond premium a contract item payable by the state with the first estimate.**
3. **Increase field personnel to permit quick and accurate determination of quantities.**
4. **Give the resident engineer more authority — particularly in approving payments for obvious overruns as they occur.**
5. **Pay for contract material delivered to the job site but not yet incorporated in the work.**
6. **Require that states pay interest on any money withheld from the contractor longer than 60 days after due date. (Pennsylvania has just adopted a modification of this principle — it will pay interest on final payments not made within 90 days after job completion.)**
7. **Adopt more reasonable retainage practices.**
8. **Streamline the entire payment system and make it simpler.**
9. **Pay for completed structures independently of road work. Since structures are ordinarily finished first, this will free contractors' money for subsequent road work.**
10. **Bid more items on lump sum and save endless computations.**

Reprints of the *ENR* "Highway Pay" report are available on request to *Engineering News-Record*, 330 West 42nd St., New York 36. Any comments and additional suggestions you may have for improving prompt and fair terms of payment on highway contract work will be appreciated. Address your letters to Merle Yontz, President . . .

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Firestones beat downtime delays!

From the Los Angeles Freeways to the Connecticut Turnpike, Firestones lead the way in beating breakdown losses. Firestone Rock Grip Tires, with S/F (safety-fortified) Nylon, roll longer with less downtime than any other tire! Two great tread designs match these off-the-highway tires to *any* job and eliminate tire changes. You get the *flotation and traction* you need in loose earth and wet going. You get S/F Nylon's armored protection for hauls over splintered shale and knife-edged rubble. Firestone tires defy cuts and slugging impacts like no other tires made. Ask your Firestone Sales Engineer about these *tubed* or *tubeless* heavy-duty tires. Call him today at your local Firestone Dealer or Store.

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Firestone

BETTER RUBBER FROM START TO FINISH

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AED Expects Buyers to Rule Equipment Market This Year

DISTRIBUTORS definitely are operating in a buyers' market, but they can not afford to "give" equipment away if they intend to remain in business.

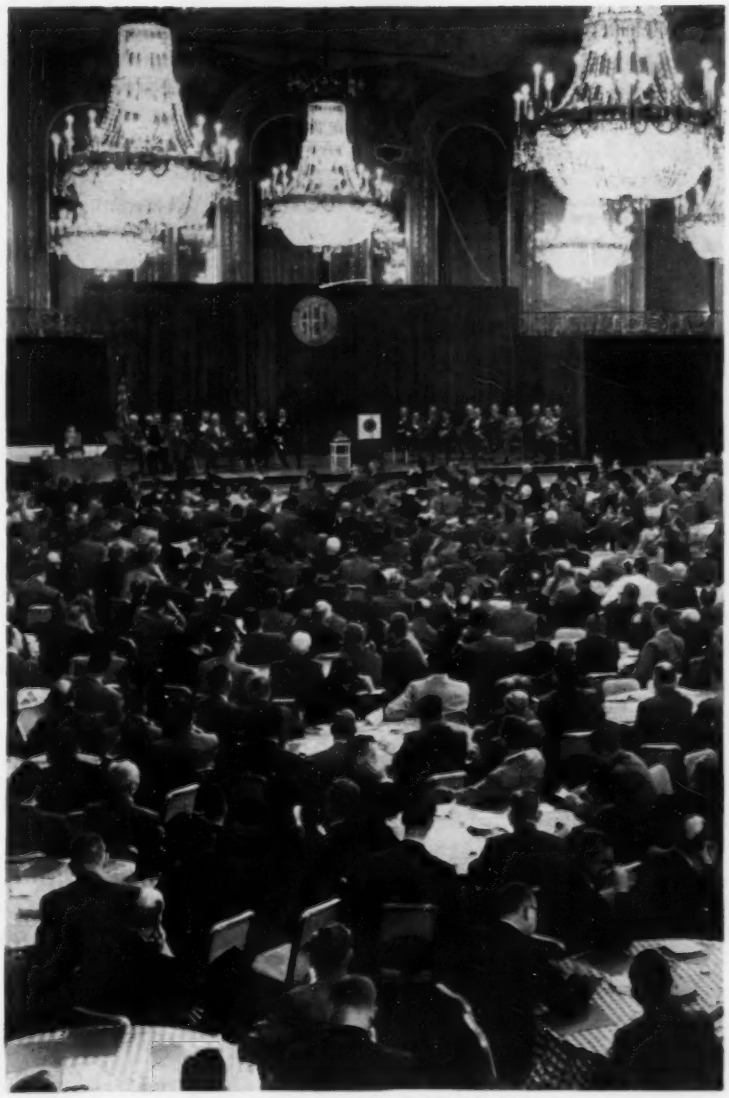
This is the attitude of the great majority of the 3,800 delegates who attended the Associated Equipment Distributors' annual convention at Chicago Jan. 26-30.

In the face of lower gross sales last year (down 7% from 1956), many distributors sold equipment at terms that threatened to cut off credit sources. They also over-valued trade-ins and built up used equipment inventories until they are 20% higher than they were a year ago, according to an AED survey.

L. Miner Doolen, 1957 president of the organization, told the distributors that "we must benefit from lessons learned in 1957." He said that used equipment represents the most important single problem facing the distributor, and he warned that "the control of costs, of service and warranty policies, of parts department operations, of credit and financial matters . . . will be the key to the final returns on our profit-and-loss statements."

Doolen called 1957 "a year that none of us will soon forget." He recalled that a year ago "a sense of optimism prevailed at this convention . . . True, there were some words of caution injected here and there, but the multi-billion-dollar highway construction program had been authorized, and most of us were champing at the bit to get on with it.

"In retrospect, it's easy to see that nearly all of us—manufacturers, distributors, and contractors alike—were swept up in this tide of optimism. We are by tradition a big, confident, flexible industry that has proved capable of rising swiftly to tremendous challenges. But our own abilities to produce over-night miracles led a lot of us to discount or overlook the immensity of the planning and leadtime requirements faced by the states and the highway planners; practical difficulties which occasion a 21-month lag from the time money is appropriated to the time actual field work gets under way."



BIG CROWD—An overflow crowd of 3,800 attended AED's annual convention. While not as optimistic as contractors, distributors see a slight rise in equipment sales this year.

Doolen told his audience: "We are today on the threshold that we thought we had achieved a year ago. The year 1958 can be at least moderately successful and rewarding for those of us who lay our foundations carefully."

But he warned that 1958 is not

NEW OFFICERS—H. D. Anderson, president of Rish Equipment Co. Bluefield, W. Va., (seated second from right) is AED's new president. New officers are (seated left to right): Jewel A. Benson, Benson Tractor Co., vice president; J. R. Borchert, Borchert-Ingersoll, Inc., treasurer; H. D. Anderson, the new president; and F. J. Fitzpatrick, Parker-Danner Co., executive vice president. Standing are (left to right): P. D. Herman, AED executive secretary; H. T. MacDonald, Kane Equipment Ltd., vice president; and F. R. Cooper, Howard-Cooper Corp., vice president.

AED CONVENTION ... continued

a year "in which distributors can afford to coast along, with the hope that the mere forces of supply and demand will shift in their favor and render success on a silver platter."

One of the most interesting sessions at the convention was a panel discussion on "the outlook for 1958." Panel members included representatives from various segments of the construction industry.

Robert M. Hoover, president of the Kansas City Bridge Co., said "it looks as if construction will play the same role in the nation's economy this year as it played in the recession years of 1948 and 1954. While the general forecast is for a recession in the economy as a whole during at least the first half of 1958, we predict an increase in new construction of from 4 to 5% for the year. In 1958 we will do about $48 billion in new construction," Hoover said. This does not include repair or maintenance work.

"We anticipate the greatest percentage rise will be for highway construction—it will spurt," he said. Using AGC estimates, Hoover said that residential construction will show a slight increase and private, non-residential building—except industrial—will continue at about the same rate. For state and local public works programs, he said there should be "consistently increasing activity."

If the country's general economic situation does not improve shortly, Hoover said, construction might get another windfall. "There are some $12 billion worth of plans for construction of government projects planned for future years that might be implemented early if that extremity is considered necessary," he said.

In answer to a question from the floor, Hoover said the greatest obstacle to equipment sales is the constant pressure on the contractor for working capital. This has forced the contractor to cut down wherever possible on equipment purchases, he said. While easier financing arrangements would help the situation, Hoover said the only real cure is an increase in the price charged by the contractor for construction.

Julien Steelman, president of both the Koehring Co. and the American Road Builders Association, saw 1958 as a year when the principal market for equipment will have to be "the replacement market, which will be at a pretty good level, actually." He said the 4 to 5% increase in construction volume is not enough to warrant a big increase in equipment sales.

The reasons why more equipment was not sold last year—a record year for construction—are complex, he said, but one important factor was that the contractor did at least some buying in 1956 that was in excess of his actual requirements for that year. Other factors responsible for the drop in equipment sales were rising costs and tight money policies, he said.

"Probably even more important was a feeling of uneasiness and uncertainty on the part of

continued on page 116

FOUR VIEWS—Representatives from various segments of the industry discuss 1958. Panel members (from left to right) are: M. B. Christensen, Bureau of Public Roads; Robert M. Hoover, president of Kansas City Bridge Co.; moderator Sam B. Lyons, Finance Magazine; J. R. Steelman, president of Koehring Co; and D. L. Salinger, director of Walter E. Heller Co., financing organization.

Here's how Oak Knoll's TerraTracs work together to speed dirtmoving. Model 800, with power-tilting dozer blade, strips and stockpiles, while Model 600 loader fills trucks.

TerraTrac® Loader and Dozer team up to move 1200 yds. per day

Oak Knoll Lawn Materials Co., 10820 Wayzata Blvd., Minneapolis, Minn., find their new 80 HP Case® TerraTrac® 800 "Tilt-Crown" dozer and 2-year-old 1-cu. yd. Model 600 loader make a *"perfect team"* for excavating, stripping and grading work.

The fast-moving TerraTracs — with higher forward and reverse speeds than any other crawlers in their class, plus instant power-shifting — *load 24 five-yd. trucks per hr.* — or around 1200 cu. yds. in 10 hours.

Team operation

The "800" dozer, equipped with a blade that can be tilted to either side by finger-touch hydraulic control — for grubbing and breaking out hard ground — digs and stockpiles dirt, while the loader picks up the spoil and dumps it in trucks. Able to develop up to 20,000 lbs. push, the torque-converter-equipped dozer easily moves an average of 150 to 180 cu. yds. per hour.

In addition to torque-converter drive, both machines have the famous "Terramatic" transmission, which provides four speeds forward and four reverse, plus power-shifting and power-steering. The "800" also has the ADDED FEATURE of *"counter-rotation"*, which enables it to spin around in its own length, with one track driving forward and the other in reverse.

Extends work range

According to Robert Jolicoeur, who founded the business in 1937, addition of the powerful "800" dozer means the company can handle more work, and can also accept a *wider variety* of jobs, such as excavating and finish-grading on large housing projects. Jolicoeur, who operates the "600", says, "I'll never go back to a clutch-type crawler again. I can turn out more work, and at the end of the day still not feel nearly as tired as I would if I'd been clutching and shifting a conventional crawler."

Your nearby Case Industrial Dealer will gladly demonstrate the right size TerraTrac, with the right equipment for your jobs. He'll also tell you about the new Case financing and *lease* plans, which enable you to *buy or rent* on easy monthly terms. Send coupon for full details.

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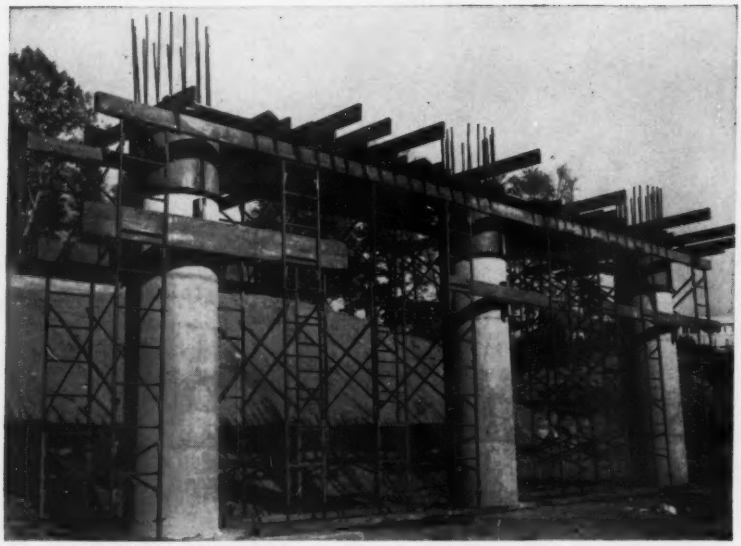
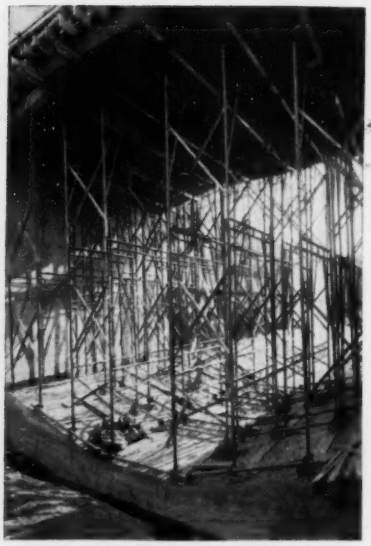
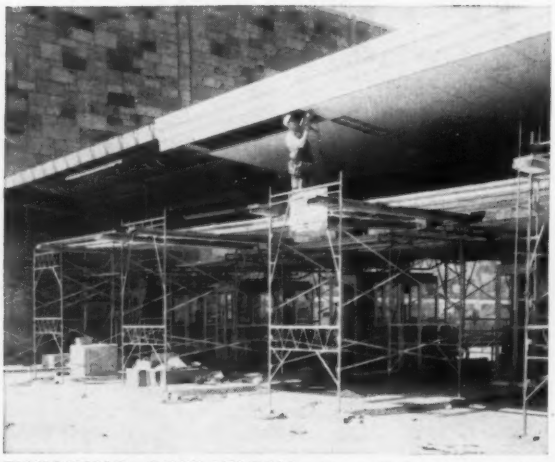


QUICK PIER BEAM SUPPORT—"Trouble Saver" 2'-wide Ladder Scaffold frames spaced 5' apart help contractor, M.D.A. Construction Co. provide easy access for forming work and support for one of 20 bridge piers on the Cross-Westchester Expressway, White Plains, N.Y. This photo shows forming and support for a pier beam 42" x 48" deep, 14' high. Many users of "Trouble Saver" Shoring say "its ease of handling means quicker job completion." Complete, accurate shoring layouts are a regular part of PS Co's engineering service available thru nation-wide offices or representatives that *sell* or *rent* "Gold Medal"® Scaffolds.



CONFORMING TO CURVES—Guy F. Atkinson Co., contractor, uses "Trouble Saver" Shoring to support Pacific Electric Ry. Co. concrete bridge, Los Angeles, over a sloped concrete channel base. Adjustable legs help meet both curves, top and bottom. Note 4" steel I-beams as stringers, furnished by PS Co.

Shoring Methods . . . for Highway Construction by The Patent Scaffolding Co., Inc.



FINISHING OPERATIONS—On toll booths at the New Jersey Plaza for the New York—New Jersey Lincoln Tunnel these "Trouble Saver" fixed Scaffolds are used to provide safe, level platforms for finishing work. The scaffolding components used here are the same as those used for shoring operations. By assembling them in towers and spacing to take the load, practically any shoring job can be done.

EASILY HANDLED BRIDGE SHORING—5'-wide prefab "Trouble Saver" Sectional Steel Shoring frames are handled easily by the crew for T. M. Page and RCT Corp., joint venturers, to obtain the correct support for the Cajon Blvd. Bridge over Devil's Creek Diversion Channel, San Bernadino, Calif. Two 6'6"-high frames, with extension legs, give 14' height. 4" steel I-beams used as stringers. 3'7" spacing between frames.

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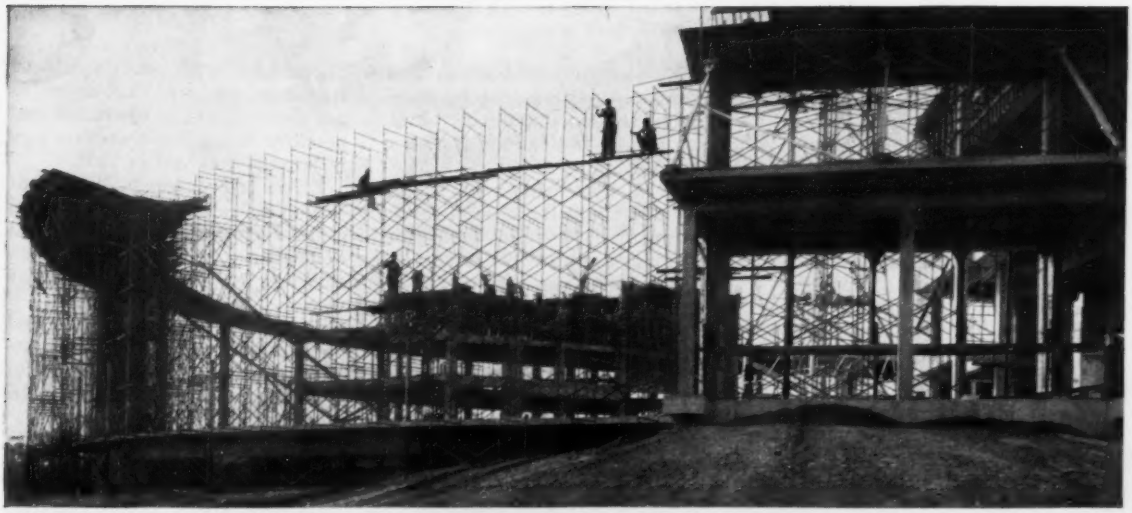
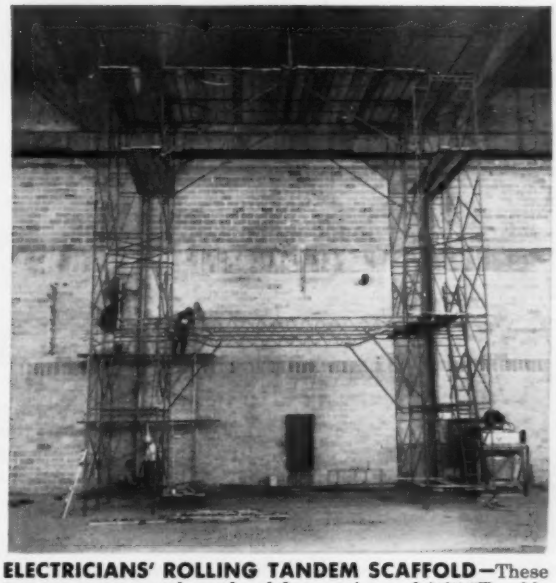
To help you with your scaffolding and concrete shoring methods, PS offers a complete nation-wide engineering service available to you locally. See the Yellow Pages in your 'phone directory for the nearest Patent Scaffolding office or representative that sells and rents "Gold Medal" Scaffolds.



SUPPORTS 270' CONCRETE CANOPY—Handling form work and providing support for circular concrete canopy around the new Municipal Auditorium, Austin, Texas, is simplified for contractor, J. J. Stokes Construction Co., by the use of modern prefab "Trouble Saver"® Steel Shoring. 580 frames are quickly and easily assembled to provide the shoring needed. Planking laid across the tops of frames also provides working platforms. By using this shoring technique the contractor cuts forming costs all along the line. "Trouble Saver" frames are 5' wide and range in height from 3' to 10', providing broad application variations to meet any scaffolding or shoring job for efficient, lower cost construction.

Scaffolding Methods . . . by Patent Scaffolding Co.

TWO-STAGE SCAFFOLDING—Contractor, Miller Davis Co., uses 3870' of "TubeLox"® Scaffolding for building a steel roof on this 215' spire. After upper portion is done, scaffold is dismantled and re-erected on the I-beams for heavier lower work. New Goodrich Mem. Chapel, Albion, Mich. Made with only four basic parts, this scaffolding is erected rapidly to conform to any shape, size or contour. Variable tube lengths, from 6' to 20', and adjustable couplers assemble to meet job conditions.



ELECTRICIANS' ROLLING TANDEM SCAFFOLD—These two towers are each made of five sections of 6'6" "Trouble Saver" Scaffolding frames set on casters, truss-joined at two points and braced at the bottom with "TubeLox" Scaffolding. They permit the contractor, J. Livingston & Co., to roll along 33'6"-high for electrical work on hangar #12, Idlewild Airport, N. Y. C. "Trouble Saver" Scaffolding accessories permit unlimited scaffolding design and use.

For complete details on PS Co. scaffolding equipment especially designed for safer, more efficient, lower cost working platforms and support for concrete construction, *check coupon for Catalog "A".*

Facts on how to cut forming costs at least 25% are fully described in special booklet, "How to Use Steel Shoring and Scaffolding in Highway Construction". *Check coupon for Bulletin G208.*

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AED CONVENTION . . . continued from page 112

our whole industry as to how far the policies of deflation would be pushed by the people in government who control these things," Steelman said.

There is a slight possibility that a situation could arise this year in which equipment buying would be considerably reduced because the volume of construction is rising only slightly, Steelman said. "But we don't think the elements that bring about this kind of situation are present today. This happens when the confidence in the future is completely shaken, and certainly there are no indications that we have this frame of mind today."

Instead, Steelman saw a possibility of a slight increase in sales. "We definitely have an easing of the money supply. We have had a reduction in the prime rate of interest, and this is more apt to bring about a situation in which our customers will tend to have more confidence in the future. There also will probably be a tendency for our customers to get their plants in readiness and possibly to do some anticipatory buying as they did in 1956."

David L. Salinger, a director of Walter F. Heller Co., an industrial financing organization, also told delegates that they could look forward to "some easing" of the money situation this year.

He told the distributors that they can expect "continued enthusiasm" on the part of industrial financing companies for the construction equipment industry. "None of the major finance companies that I know of are planning curtailed operations in this field," he said. "Quite the contrary, we expect to continue to help this industry and on a constantly increasing scale."

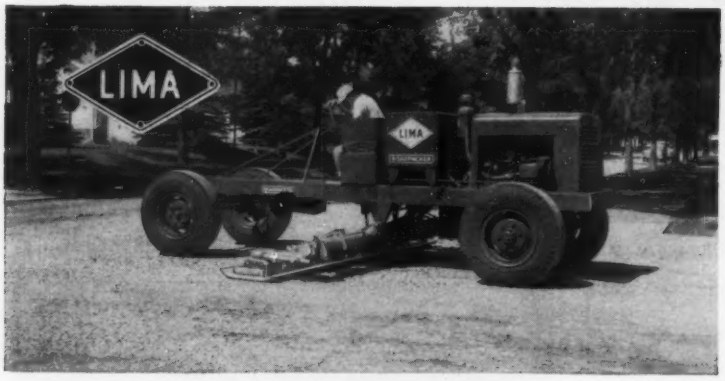
But he told the distributors to keep their own houses in order. "Your own will-power will be the measure of your ability to withstand the siren call of the weak credit risk, the diluted down-payment, the over-valued trade-in, the consequent draining off of capital into used equipment, and, eventually, losses that are difficult to digest."

M. B. Christensen, chief of construction of the Office of Engineering of the U.S. Bureau of Public Roads, said the outlook for the federal highway program is "for a steady increase in the volume of work for the next two to five years, and then for a continuation at a high level for at least another decade."

But he held out little hope that the program would be finished in the original 13-yr schedule. In addition to the leadtime required before plans reach the construction stage, he said, the rate of construction is controlled by monies available in the trust fund from which the program is financed.

"It appears that these revenues may not accrue at a sufficiently rapid rate to permit the program to proceed as originally contemplated," Christensen said. Public Roads Administrator Bertram D. Tallamy already has suggested that the program be extended to 20 to 22 yrs.

Christensen said that present estimates indicate work having a total value of $2.75 billion will be let in 1958. "And it is hoped that this figure can be increased considerably," he added.



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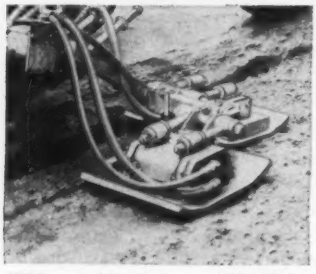

Widener Attachment—Vibrating shoes compact material in widening trench while Roadpacker runs on existing pavement. Easily adjusted for various width trenches.

Six 420 lb. shoes provide the vibrating and tamping action. The LIMA ROADPACKER is a cost-cutting, vibratory compactor that penetrates deeper and covers a 13-ft., 1-in. width. The shoes are raised and lowered hydraulically; compacting is done equally well forward or in reverse. The ROADPACKER travels to the job at 28 m.p.h.

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ROADPACKER FEATURES

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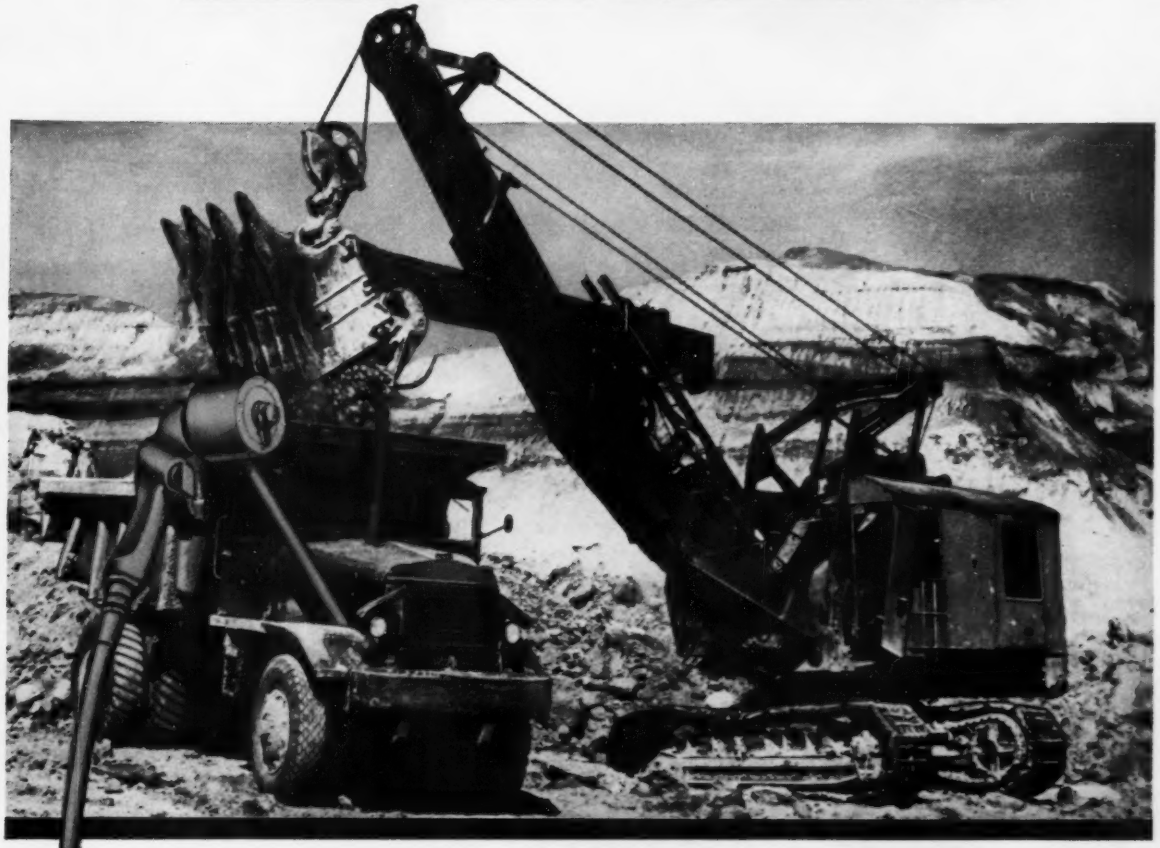

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SINCLAIR SUPER TENOL

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Over 400 Euclid Rear-Dumps were put to work on the U. S. side of the St. Lawrence Seaway—with many others on the Canadian side. The 22-ton "Euc" outnumbered all other makes and models of off-highway haulers on this huge earthmoving project.

On the Iron Ranges almost 4 times as much ore is moved in "Eucs" as in all other make Rear-Dumps! In Minnesota alone more than 1300 Euclids of 15 to 50 ton capacity are hauling ore and overburden.

Dam construction demands equipment that can take the pounding of heavy excavation loaded by big shovels and draglines and keep coming back for more! "Eucs" are unequalled for job availability and for low cost production—that's why they've been the choice of dam builders for many years.

Rear-Dump "Eucs" have proved their rugged dependability and outstanding performance on the toughest jobs. With engines of 143 to a total of 670 h.p., they have plenty of power to move big loads on steep grades and difficult hauls often encountered in highway work.

With capacities ranging from 10 to 50 tons, there's a Rear-Dump "Euc" to fit any quarry or open pit mining operation. Simple design, combined with ample power and speed, easy handling and minimum downtime results in more tonnage moved at lowest cost. Quarry body is optional on most models.

experience gives you Bonus Benefits

For 25 years Euclid has specialized in designing and building equipment for heavy, off-highway earthmoving. The dependable low cost performance of these "Eucs" has made them the standard of comparison for contractors, mines and quarries around the world. About 7 of every 10 off-highway Rear-Dumps are Euclids.

Although this unmatched experience may not be apparent when comparing specifications, it assures bonus benefits for Euclid owners—cost-cutting advantages not provided by comparable equipment. The greater use of Euclids results in faster complete field exposure to operating and maintenance characteristics under all conditions. It assures advanced design that pays off in more work-ability and minimum downtime on the job.

With Euclid's larger machine population, it's economically possible for Euclid dealers to provide more complete service facilities and ready availability of all factory engineered replacement parts. It's factors like these that enable owners to keep their "Eucs" operating at peak efficiency with unusually high availability and low production cost.

When you're considering Rear-Dumps, get facts and figures from your Euclid dealer—have him show you why ***Euclids are your best investment.***

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Your Euclid Dealer offers
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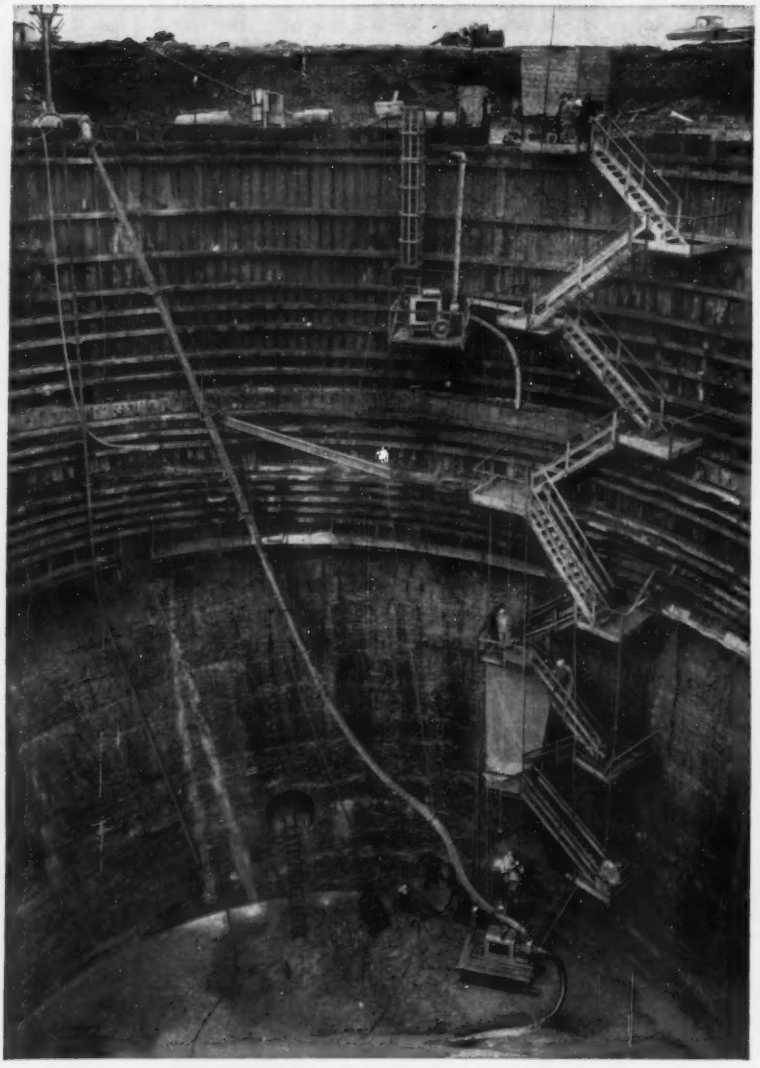

PUMPING 127' VERTICALLY AND 250' AWAY to drain 127' deep x 100' diameter riverside excavation for sewer pumping station. Pump is a Jaeger 10" diesel. Above it, a Jaeger 6" pump drains collector ring for the sheet-piled upper half of the hole.

135 LB. ALUMINUM DIAPHRAGM PUMP HAS PATENTED SPRING-BOTTOM BOWL: Often, an inexpensive 2" or 2½" suction hose is all you need with this light yet powerful 3" pump. Exclusive spring-bottom bowl is shock-absorbing and self-cleaning. Also built in 4" size.

OVER 100,000 GPH AT ONLY 1450 RPM: A Jaeger 6" pump is the only one of its size that moves as much as 1720 gpm at this easy, fuel-saving speed. Holds prime, too, for pumping seepage after hole has been dewatered.

ENOUGH PRESSURE FOR 3 JOBS: This Jaeger 6CPH jetting pump is simultaneously supplying two jetting rigs and a steam boiler, putting in 50' timber piles for filtration plant. Jaeger builds the pressure pumps you want, sizes 2" to 6", pressures to 300 psi.

Jaeger pumps are oversize; give oversize performance

You're repaid for knowing pumps when you buy a Jaeger "Sure Prime". You get a bigger shell and impeller, an engine of the largest horsepower applicable, a positively lubricated seal that seems to last forever, and two independent, simultaneous priming actions. Result—doubly-sure fast priming under all conditions, bigger capacity at slower operating speeds, sustained efficiency and longest life from both pump and engine.

Base your pump buying on up-to-date performance data. See your Jaeger distributor or write for guaranteed actual performance of latest model Jaeger pumps in 1½" to 10" sizes.

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Photo courtesy of American Bridge Division, United States Steel Corporation

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The *Clark-Ross* Carrier pictured above hauls girders from a storage yard one mile away to this construction site. Working with another Carrier an average of 48 net tons are moved each hour. On these short runs, each Carrier is capable of outhauling 5 flat-bed trailer rigs. Reason is: the Carrier is *self*-loading and *self*-unloading.

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Reports from users point up the fact that once a Carrier is used in their operation, they find that *no other kind of materials handling equipment can do the job as economically*. Let us send you some reports from the field to substantiate this. Simply write: Carrier Field Report, Clark Equipment Co., Battle Creek, Mich.

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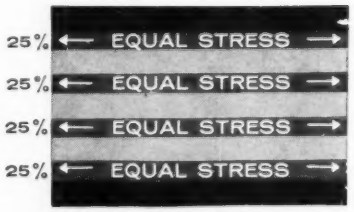

BBC-BALANCED BELT CONSTRUCTION

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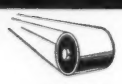
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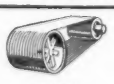
V-BELTS

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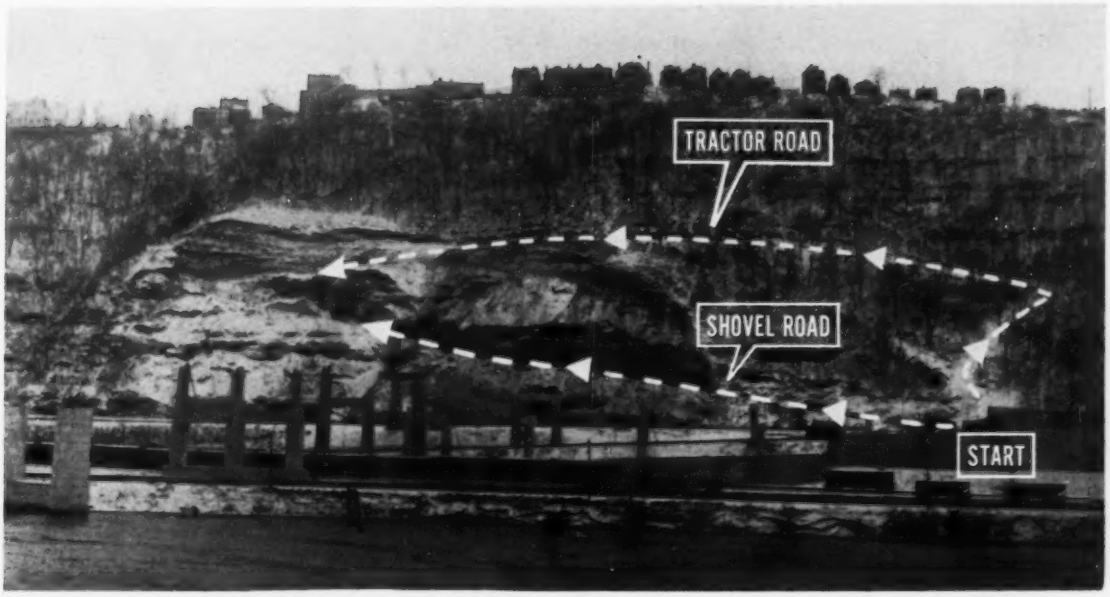


Dozer cuts high road, shovel digs low road...

Cliff-Climbing Rigs Clear Portal

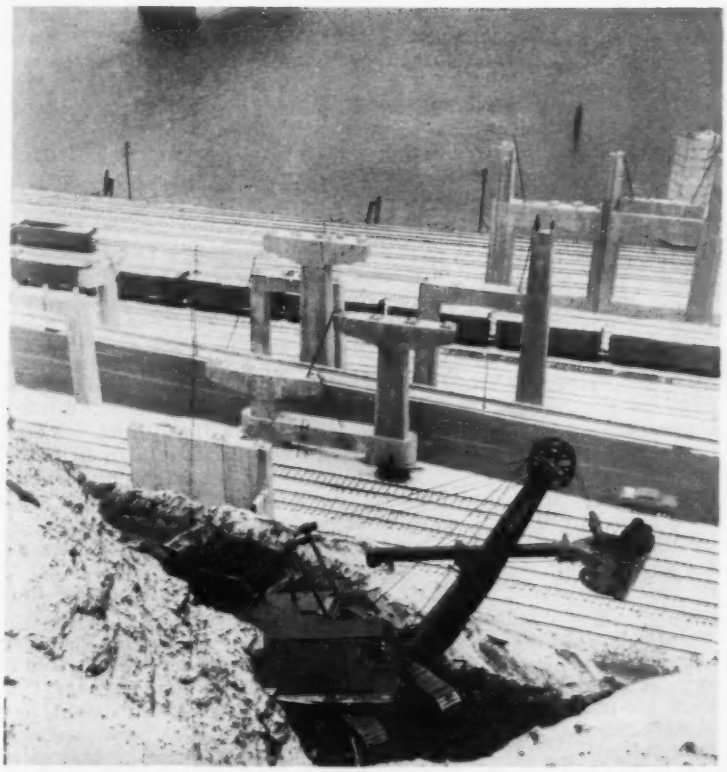
AN ACROBATIC BULLDOZER and a cliff-climbing shovel, with a pair of cool-nerved operators at the controls, are carving out a tunnel portal high on the face of a sheer rock cliff.

Latrobe Construction Co. of Latrobe, Pa., has a contract to open up the almost inaccessible portal sites for the Fort Pitt highway tunnel through Mount Washington in Pittsburgh, Pa. They have finished the south portal; the tunnel contractor already has started boring into the mountain at that point. Now they are doing some fancy mountain climbing to reach the tougher north portal.

Rough Location

The job of building the Fort Pitt portals is a real challenge. Mount Washington is a rugged mountain on the south bank of the Monongahela River directly across from the Golden Triangle, the heart of Pittsburgh's business district. Its north and south sides are so steep that even Pittsburgh construction men, who built half the city on hillsides, have left these cliffs bare.

The mountain separates downtown Pittsburgh from the sprawling suburbs to the south. For



PORTAL SITE—High above railroad, shovel digs into cliff to open up portal for Fort Pitt Tunnel. Piers are for double deck bridge that connects with twin-tube tunnel.

LOW ROAD—Shovel, with a bulldozer mopping up behind, cuts a side-hill access road from base of cliff to site of lower portal.

HIGH ROAD—Drill starts enlarging upper portal site at end of road that dozer cut across cliff face. Shovel works on lower part.

years it has forced harassed commuters from these suburbs to drive around it and fight their way to work over the congested Point Bridge.

To straighten out traffic, the state highway department built half the Penn-Lincoln Parkway through the southern communities and up to the south side of Mount Washington. They pushed the other half of the parkway through downtown Pittsburgh to the edge of the river and are bridging it across the river to the north side of the mountain. The Fort Pitt tunnel through the mountain will join these two parkway halves.

Both ends of the tunnel are on a cliff face. To match the high level bridge, the north portal is about one-third of the way up the cliff and almost inaccessible from the ground. The south portal, at ground level, is easier to reach.

South Portal

The fastest way to drive a tunnel is to work from both ends at once. On this job the tunnel contractor decided that driving from the north end would be too difficult; he is driving the entire tunnel from the south end. So Latrobe, who holds the sub-contract to build both portals, finished the south end first so the tunnel contractor could get started.

The south site, even at ground level, is cramped for space. Two major expressways meet at the base of the cliff, and two high level railway trestles cross one of the roads. To make working space at the entrance to the tunnel, Latrobe had to cut away a big chunk from the cliffside.

They cut 320,000 cu yd of rock from the cliff face and dumped it in a nearby ravine. To get to the ravine they had to travel on one of the expressways. This meant limiting their carriers to on-highway trucks acceptable to the highway department. It also meant that rush hour traffic severely hampered hauling operations.

But on the whole Latrobe had little trouble at the south portal.

North Portal

The north portal is a different story. The rock excavation here is only 90,000 cu yd. But there are several new complications. First of all, the site on the high cliffside is almost inaccessible to machines. Secondly, a main line of the Pennsylvania Railroad runs along the base of the cliff so Latrobe has to be very careful with the blasting above.

The arrangement of the tunnel's twin tubes is different at this end. At the south end they are side by side at ground level to meet a four-lane highway. Under the mountain they twist, and come out at the north end one on top of the other to feed on to a double-deck bridge.

The first job was to get machines up the cliff. Joe Steinbach, superintendent for Latrobe, decided to attempt two access roads, a high road leading to the upper tube, and a low road to the lower tube.

About a quarter of a mile along the mountain from the portal he discovered an indentation in the cliff where the face wasn't as steep as elsewhere. From this point he launched his two-pronged attack to reach the portal.

He started a Northwest 80D shovel digging from ground level upward toward the site of the lower portal. The shovel chewed its way along the side of the cliff, angling up to the lower portal elevation. A Cat DB following it, smoothed out the side-hill cut to form a road.

A second D8 took the high road. It clawed its way straight up the cliff, through the indentation, almost to the elevation of the upper portal. Then it turned 90 deg and cut a narrow side-hill trail horizontally across the cliff to the portal site.

Getting the bulldozer up the cliff was the most exciting part of the operation. The operator eased the machine up a few feet at a time, building up the trail with loose earth as he went.

The job called for a cool, daring operator, but the man was too cool to suit Joe Steinbach. Joe watched the machine inch its way to the top and breathed a

continued on page 128

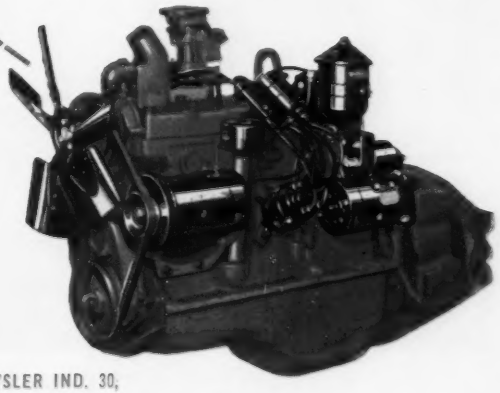
SILENT HOIST & CRANE CO. EXECUTIVES F. E. Flynn, Chief Engineer (left) and M. M. Botnick, General Sales Manager (right) review specifications for the company's latest model Krane Kar, powered by a Chrysler Industrial 30 Engine with fluid coupling. Below, they watch the Krane Kar in operation. This model features an even greater degree of maneuverability and boom flexibility.

KRANE KAR

why Silent Hoist & Crane Co. powers with Chrysler Industrial Engines

SEND FOR 1958 INDUSTRIAL ENGINE CATALOG: Dept. E3, Industrial Engine Division, Chrysler Corporation, Detroit 31, Mich.

Silent Hoist & Crane Co. is a pioneer in the field of heavy-duty materials handling equipment. The famous KRANE KAR and LIFT-O-KRANE are designed for tough jobs and demanding conditions. That's why the company chooses rugged Chrysler Industrial Power. Equally important, Chrysler engines are available with fluid coupling to reduce shock load, prolong engine life. Experience has proved to Silent Hoist engineers, the superiority of Chrysler Industrial Engines. And Chrysler's reputation helps Silent Hoist sell customers—and keep them sold.



CHRYSLER IND. 30, 230 cu. inch displacement engine powers the Krane Kar. Heavier units are powered with Chrysler Ind. 33, 265 cu. inch displacement.

Chrysler
INDUSTRIAL ENGINES
INDUSTRIAL ENGINE DIVISION • CHRYSLER CORPORATION

Pasadena freeway bridge demonstrates **Three of fir plywood**

Fir plywood forms cut costs and solve complex design problems on this Pasadena freeway bridge

key advantages concrete forms

1. design adaptability

On this 3.3 million dollar Colorado Street freeway bridge, Pasadena, California, fir plywood helped solve a complex form problem posed by the six giant arch ribs supporting the roadway. Forms were 5/8" fir plywood, specified because of its adaptability to built-up slip forms.

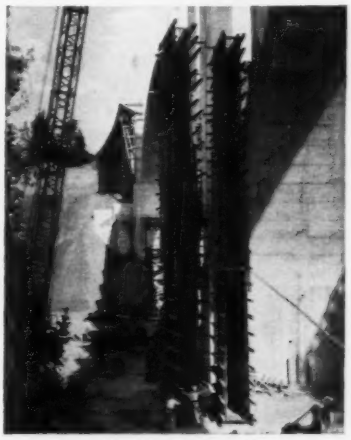
2. time and labor savings

Fir plywood also speeded construction time for huge built-up form sections used for scores of spandrel columns and main pier columns. Sections ranged from 5 to 80 feet in height. Workability and multiple re-use make fir plywood ideal for such applications.

3. smooth concrete surfaces

Fir plywood was specified by the California State Highway Department to assure smooth surfaces on all exposed concrete. The contractor, Guy F. Atkinson Co., developed the form system which was moved laterally from one arch to the other, an engineering feat considered to be unique in the construction field.

Close-up of 5/8" fir plywood arch rib form section. After pouring one set of arches, entire falsework was lowered several inches and skidded into place for second set.



Workmen stripping one of giant built-up 80-foot column forms. Forms were of 5/8" fir plywood with 2 x 6 studs and walers. Multiple re-use is one of plywood's many advantages in the form field.

DFPA TESTED QUALITY

Douglas Fir Plywood Association is a non-profit, industry organization devoted to research, promotion, quality maintenance.

ALWAYS SPECIFY BY

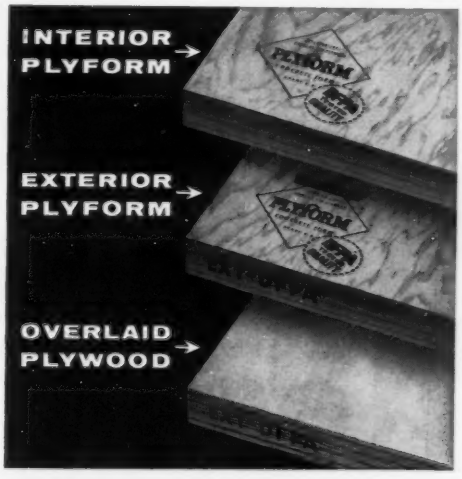
DFPA GRADE-TRADEMARKS

INTERIOR PLYFORM®—standard concrete form grade made with moisture-resistant glue. Gives multiple (10-12) re-uses.

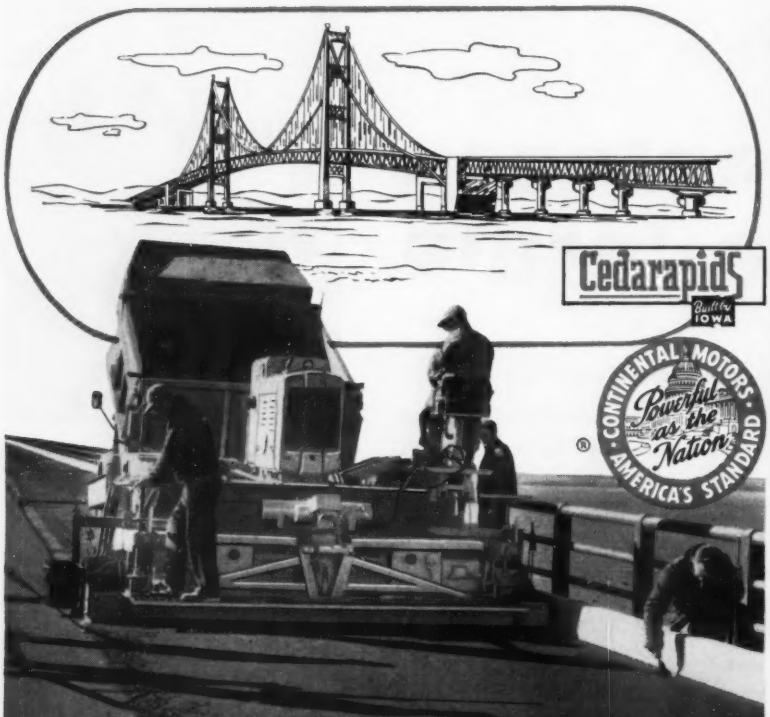
EXTERIOR PLYFORM®—standard form grade made with waterproof glue. Gives maximum (25 or more) re-uses.

OVERLAID FIR PLYWOOD—special panel with hard, glossy fused resin-fiber surfaces. Waterproof glue. Up to 200 re-uses.

FOR YOUR FILES: Complete application-specification-design portfolio assembly. Write (USA Only) Douglas Fir Plywood Association, Tacoma 2, Washington, Dept. 136



COLORADO STREET PIONEER BRIDGE
LOCATION: Pasadena, California
CONTRACTOR: Guy F. Atkinson Co.
South San Francisco, California



Teamwork on the
NEW MACKINAC BRIDGE

Bituminous Surface Laid Smooth and Fast by
CEDARAPIDS Paver with Continental Red Seal Power

This *Cedarapids Paver, surfacing Michigan's new Mackinac Bridge, is another fine example of teamwork between Continental Motors and leading builders of specialized machines. The job presented tricky problems, but the paver took them all in stride. In the bridge's length of nearly five miles are some 80 expansion joints, each with steel lips extending 1½ inches above the concrete bridge floor. Cedarapids' unique oscillating track rollers enabled the new paver to pass over the joints without disturbing the screed, and once under way, the work proceeded at 32 fpm.

*Product of Iowa Mfg. Co., Cedar Rapids, Iowa.

CEDARAPIDS PRESENTS ANOTHER STRIKING PROOF OF THE STATEMENT:
ANY EQUIPMENT IS BETTER EQUIPMENT WITH
DEPENDABLE RED SEAL POWER

WORLD'S LEADING INDEPENDENT MANUFACTURER OF INTERNAL COMBUSTION ENGINES. CONTINENTAL MOTORS OPERATES PLANTS IN ATLANTA, DALLAS, DETROIT, MILWAUKEE, MUSKEGON, AND TOLEDO, AND IN ST. THOMAS, ONT., PRODUCING AIR-COOLED AND LIQUID-COOLED ENGINES FOR USE ON LAND, AT SEA AND IN THE AIR.

Continental Motors Corporation
MUSKEGON • MICHIGAN

CLIFF-CLIMBING RIGS...

continued from page 128

sigh of relief when it started across the easier horizontal leg of the trip. He figured the dozer was up there to stay.

A short time later he was surprised to see it sliding down the trail all the way to the bottom. The operator explained that everything was all right. He had merely run short of fuel and had come down for a refill. After Steinbach watched the machine make its second precarious trip up the cliff he ordered the operator to stay on top. Thereafter he sent up the fuel in cans.

When the dozer reached the upper portal side and the shovel got to the bottom level, they hacked out a working space for more machines. A Northwest truck crane followed the shovel up the road to the portal site. It reached over the edge of the cliff and hoisted a 2-in. Joy drill and an Ingersoll-Rand compressor to handle drilling at the upper portal.

Blasting rock for the portal ledge is tricky because of the railroad below. Latrobe had to cut down drastically on the size of each shot to prevent rock from falling on the tracks.

Instead of a normal blast pattern of perhaps 150 holes per shot, they started with only two or three holes. As they cut deeper into the cliff there was less chance of rock falling over the edge so they now risk up to 10 holes per shot.

Some rock is bound to fall on the tracks. So a crew at the bottom of the cliff stands by with air hammers to break up rock that does fall. Steinbach times his blasts to go off during the longest available intervals between passing trains.

During a blast a railway inspector keeps a constant telephone contact with nearby switch points to warn approaching trains if necessary. So far the blasting has gone smoothly; only once has a train had to slow down because of rock on the track.

Latrobe is now about half finished with the north portal. At the rate they are working, they should finish well before completion of the main tunnel, scheduled for late 1959. By that time the Fort Pitt Bridge, now under construction by the American Bridge Division of U. S. Steel, will be ready.

Bucyrus-Erie Walkers Set Fast Pace On Big Yardage Jobs

The ability of Bucyrus-Erie walking draglines to move big yardages at consistently low cost has made them preferred for large earthmoving jobs everywhere. Owners praise them for their range, capacity, strength, and speed.

To move big yardages economically, choose from the world's largest selection of walking draglines. Contact Bucyrus-Erie Company for complete information. Bucyrus-Erie Company, South Milwaukee, Wisconsin.

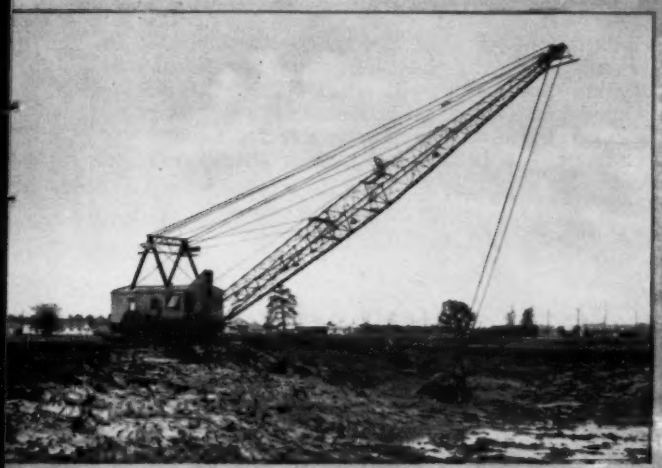
167L57C

BUCYRUS ERIE

A Familiar Sign at Scenes of Progress

CANALS — Earth really moves as this 200-W excavates for a navigation canal. The machine's 140-ft. boom carries a 6½-yd. bucket. Modern front-end design that combines great strength with light weight contributes to outstanding performance — by permitting Bucyrus-Erie walking draglines to swing big buckets on long booms.

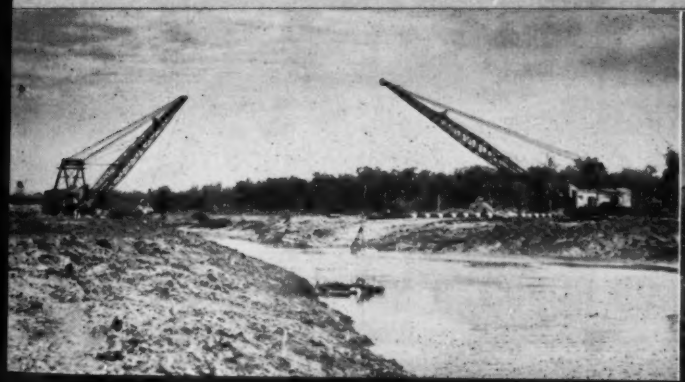
FLOOD CONTROL LEVEES — Excavating through coral rock, this 200-W builds a flood control levee in the Florida Everglades. It is equipped with a 6-yd. bucket on a 110-ft. boom. Heavy duty construction from base to boom point cuts maintenance costs, adds years to machine life.



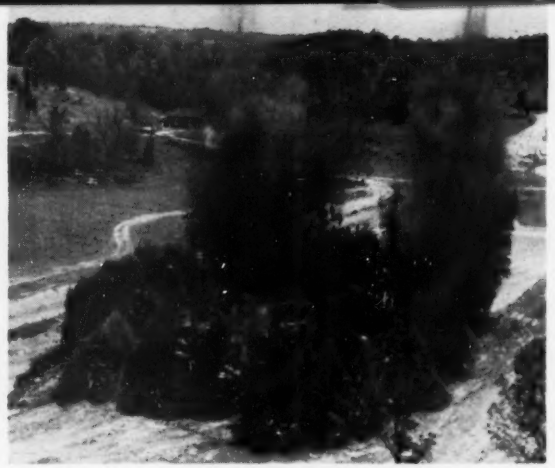
ST. LAWRENCE SEAWAY — This 200-W walker equipped with 6-yd. bucket moves earth on the Red Mills Point job near Ogdensburg, N.Y. Month-after-month dependability and low maintenance assure high volume, economical production.

WATERWAYS — A 7-W and 200-W team up in this channel improvement project in Louisiana. Exclusive Bucyrus-Erie walking mechanism permits smooth, sure moveups, easy maneuvering to most advantageous working position.

DAMS — Working with a 6-yd. bucket on a 120-ft. boom, this 190-W builds an earth dam for a settling area at a Florida phosphate mine. Ward Leonard variable voltage control provides extra fast acceleration and deceleration to speed work cycles.



Shooting with ammonium nitrate-fuel oil mixture, A. E. Burgess Co., Inc., cuts powder cost to 4.5 cents per yd of rock while pushing big cut for road project.



Blasting Agent Slashes Powder Costs by 75%

By Frank W. Corrigan
Assistant Editor

A NEW BLASTING agent that is safe, easy-to-handle, and effective can cut powder costs for surfacing blasting by as much as 75%. The explosive is a simple mixture of fertilizer-grade ammonium nitrate and fuel oil.

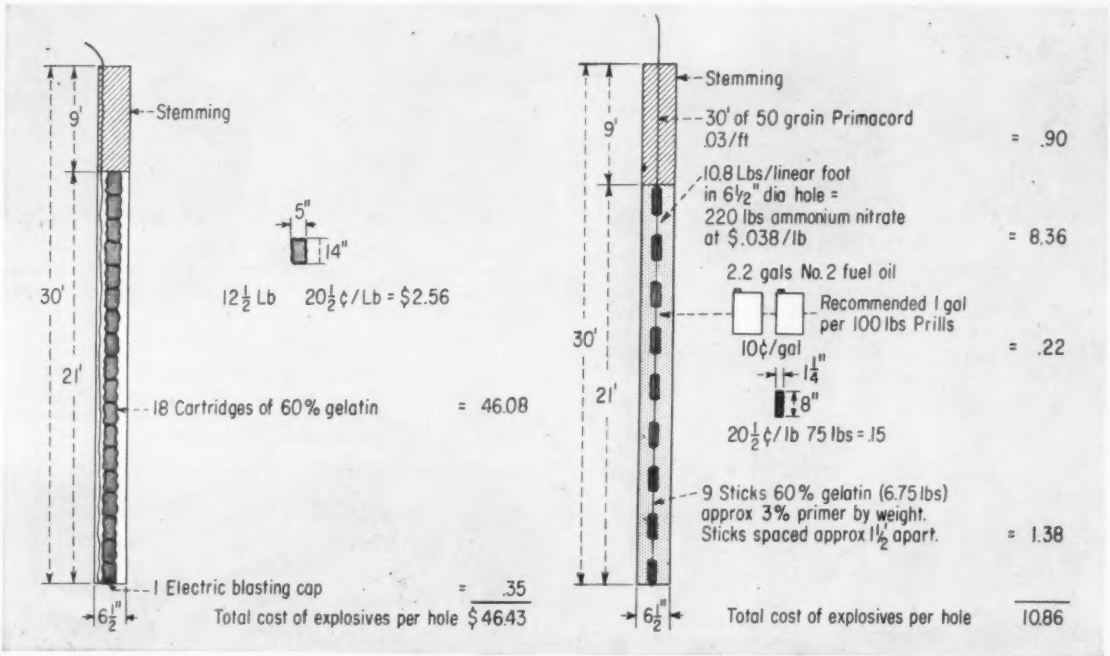
When conditions are right, the mixture yields equivalent pound-for-pound results with 60% gelatin dynamite, producers say. Ammonium nitrate sells for slightly more than three cents per lb.

Monsanto Chemical Co., the country's leading producer of ammonium nitrate, estimates the cost of loading a 30-ft deep, 6½-in. dia hole with 60% gelatin and blasting caps at about $46; the cost for loading the same hole with ammonium nitrate-fuel oil, plus a primer, is about $10.86.

In this hole, the cost for blasting hard rock with gelatin averages between 14 and 18 cents per cu yd; the cost for blasting the same material with ammonium nitrate-fuel oil is between 2.5 and 5 cents per cu yd, depending upon the choice of a primer.

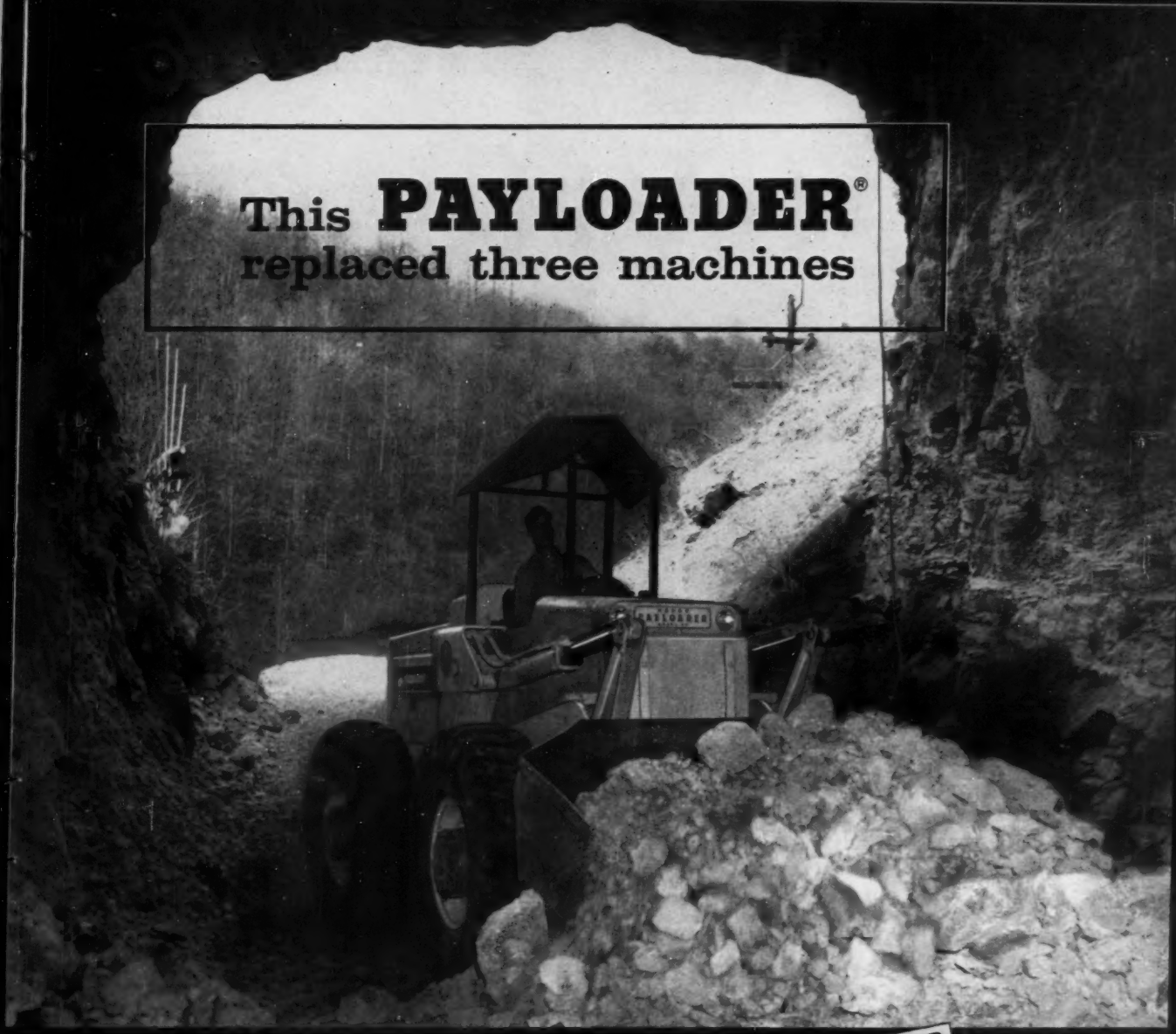
Ammonium nitrate as an explosive agent has drawbacks that limit its application in the construction field. It is considered a "non-permissible" explosive by the Bureau of Mines because it produces so much gas and it can not be used underground. Difficulties in loading horizontal holes properly make it impractical for this type of blasting. Also, while ammonium nitrate can be shot in small diameter holes, savings increase as the diameter of the blast hole increases; and because ammonium nitrate is a

continued on page 134


9'
Stemming
30'
21'
5"
14"
12½ Lb 20½¢/Lb = $2.56
18 Cartridges of 60% gelatin = 46.08
1 Electric blasting cap = .35
6½"
Total cost of explosives per hole $46.43
9'
Stemming
30'
21'
30' of 50 grain Primacord .03/ft = .90
10.8 Lbs/linear foot in 6½" dia hole = 220 lbs ammonium nitrate at $.038/lb = 8.36
2.2 gals No. 2 fuel oil
Recommended 1 gal per 100 lbs Prills
10¢/gal = .22
1¼"
8"
20½¢/lb 75 lbs = .15
9 Sticks 60% gelatin (6.75 lbs) approx 3% primer by weight. Sticks spaced approx 1½' apart. = 1.38
6½"
Total cost of explosives per hole 10.86

ONE-FOURTH THE COST—Shooting with 60% gelatin in hard rock costs 14-18 cents per yd. In same hole, ammonium nitrate cuts cost to 4-5 cents per yd. But ammonium nitrate has drawbacks: it can't be used in wet holes, and it is hard to detonate.

This PAYLOADER® replaced three machines



Contractor Ralph E. Mills Co., Inc. of Salem, Virginia, is enlarging the bore of three Norfolk and Western Railway tunnels built in 1888 and located near the Virginia-West Virginia border. This model HO "PAYLOADER" tractor-shovel has taken over the job of removing the blasted rock from the tunnel after each shot.

George E. Steele, Mills' superintendent, describes its performance this way: "The 'PAYLOADER' is doing this job previously handled by an overhead loader and two off-road shuttle trucks. The result is a saving of ½ the equipment cost and of two operators, also less fuel and maintenance."

He adds, "After a shot today, the HO loaded out and carried thirty-four, 2-yard loads to the spoil area in 40 minutes—a 150 foot one-way haul distance. On this type of tunnel excavation where maximum haul distance does not exceed 500 feet, I prefer the HO 'PAYLOADER' over any machines I ever used."

The power, traction, speed and versatility of a 4-wheel-drive "PAYLOADER" can be used to boost output and profit many ways on your jobs also. Contact your Hough Distributor for full information.

Modern Materials Handling Equipment

THE FRANK G. HOUGH CO.

LIBERTYVILLE, ILLINOIS

SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

SAY "HUFF"

PURCHASE AND HOUGH LEASE PLANS

Now your Hough Distributor has at his disposal the broadest and most complete set of financing plans ever offered:—TIME PAYMENT . . . LEASING PLANS*, with or without OPTION TO PURCHASE—any and all kinds of financing to best fit your needs for the purchase of "PAYLOADER" equipment. See him today.

*(Available in Continental U.S.A.)

THE FRANK G. HOUGH CO.
706 Sunnyside Ave., Libertyville, Ill.

Send data on "PAYLOADER" tractor-shovels:

- ☐ model HO (9,000 lb. carry capacity)
- ☐ model HH (7,000 lb. carry capacity)
- ☐ model HU (5,000 lb. carry capacity)

Name.....

Title.....

Company.....

Street.....

City..... State.....

3-B-1

New Dam on the Skagit

In Mount Baker National Forest, in Washington, wagon drills and jackhammers have been boring into hard granite along the Skagit River. Equipped in most cases with Bethlehem Hollow Drill Steel, these drills are putting down blast holes so that about 400,000 cu yd of rock can be moved to make way for the high Gorge Dam, a project of Seattle City Light.

The new dam, of concrete construction, is scheduled for completion in 1960. It will be about 670 feet long and 285 feet high, and will replace the existing Gorge Division Dam. By providing an 88-ft higher head of water, the capacity of the Gorge Powerhouse will be increased from 108,000 kw to 165,000 kw.

Whatever the type of rock removal, you're sure to get dependable drilling, and minimum breakage, with Bethlehem Hollow. This is because it is rolled from a special fatigue-resistant steel, and has a uniformly round hole which is centrally located in the bar. Bethlehem Hollow has a wide quenching range. It can be heat-treated easily for the proper balance of toughness and wear-resistance, resulting in durable threads and shanks.

Bethlehem Hollow, in Carbon and Ultra-Alloy grades, comes in rounds, hexagons, and quarter-octagons in lengths from 18 to 27 ft. Longer lengths can also be furnished to meet special requirements.

You'll like Bethlehem Hollow.

Using 1-in. hexagon Bethlehem Hollow for 12-ft blast holes at site of high Gorge Dam, on Skagit River, in Washington. Contractors: Merritt-Chapman & Scott Corporation.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM HOLLOW DRILL STEEL

CARBON AND ULTRA-ALLOY

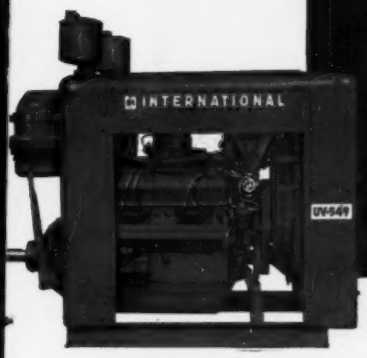
BETHLEHEM STEEL

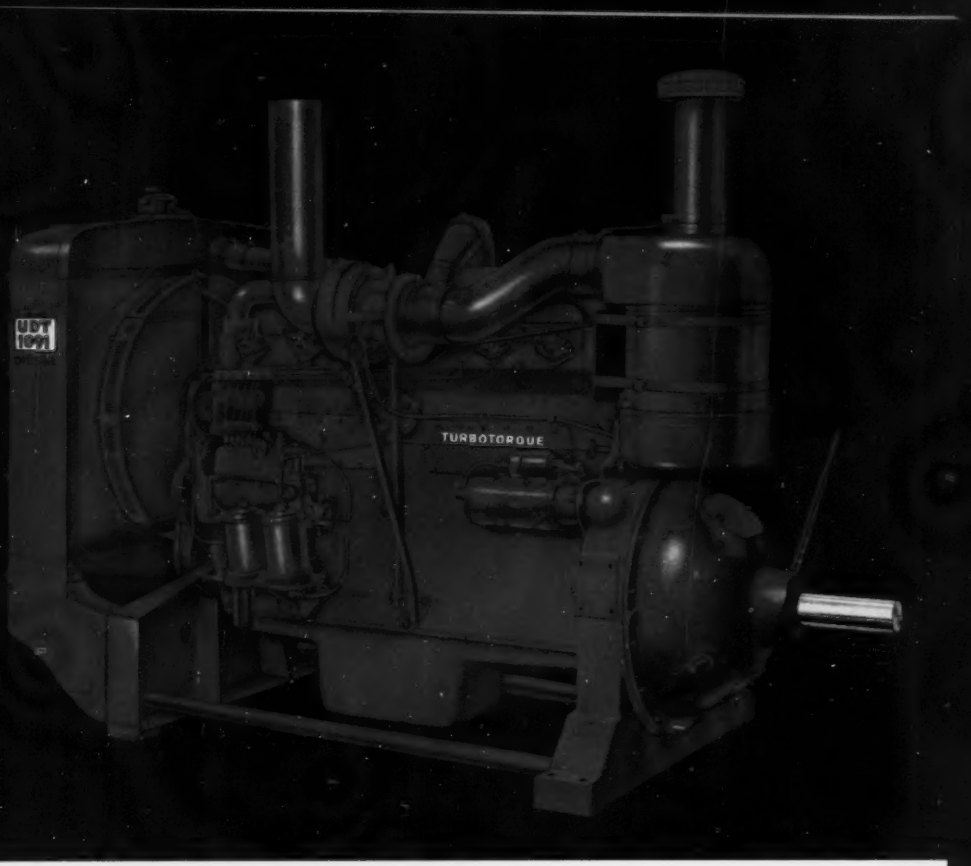
NEW UDT-1091

Turbotorque Power Unit 250 bhp @ 1,500 rpm (complete with radiator and fan). See table for six other IH diesels.

NEW UV-549V-8 Power Unit

208 net hp on gasoline @ 2,600 rpm (complete with radiator and fan). See table for other new IH V-8's.





Power range of INTERNATIONAL engines increased to 250 shaft hp

Need more low cost power for your machines? International has it in four new big economy sizes: A new UDT-1091 Turbotorque diesel power unit that delivers 250 shaft hp @ 1,500 rpm; and three new power-packed V-8's that can be equipped for operation on the fuel of your choice—gasoline, LP gas or natural gas.

The new UDT-1091 Turbotorque diesel becomes the seventh model in the International heavy-duty, 4-cycle diesel power unit line. With the same dimensions as the 200 hp naturally aspirated UD-1091, the UDT-1091 supplies 25% more dependable diesel power for your heavy-duty jobs. Like all International diesels it burns low-cost No. 2 diesel fuel, starts easily, gives thousands of hours of trouble-free operation, and is simple and inexpensive to maintain.

The three new International V-8's are available for operation on gasoline, LPG, and natural gas—a big buy where compact dependable high power is needed.

Save important money by specifying these or 17 other Internationals on your new equipment or by seeing your nearby International Power Unit Distributor or Dealer when it's time to repower.

INTERNATIONAL POWER RATINGS

Diesel Power Units with Fan and Radiator		
Model	No. cyls.	Intermittent Load bhp
UDT-1091	6	250 @ 1,500 rpm
UD-1091	6	202 @ 1,500 rpm
UD-18A	6	125 @ 1,600 rpm
UD-525	6	115 @ 1,800 rpm
UD-14A	4	95 @ 1,650 rpm
UD-350	4	75 @ 1,800 rpm
UD-281	4	60 @ 1,800 rpm

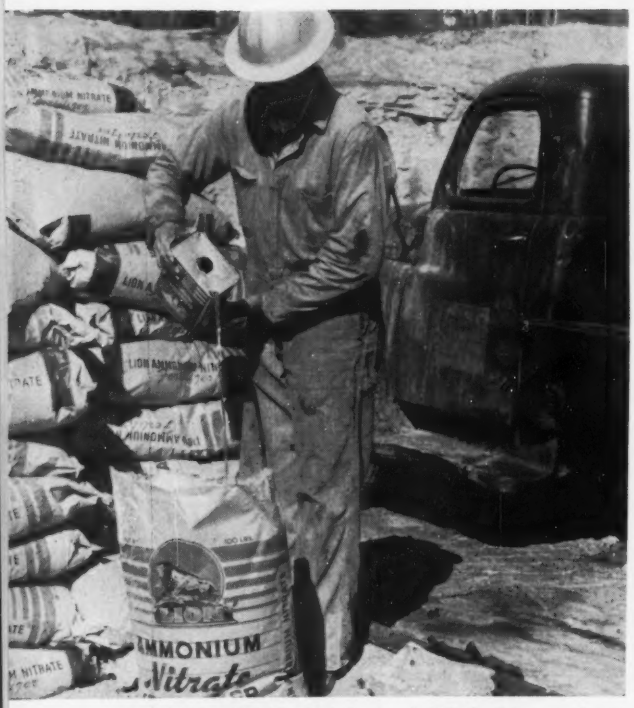
Complete V-8 Gasoline Power Units		
Model	*Net hp rpm	Stripped engine peak hp—rpm
UV-401	160 @ 2,800	206 @ 3,600
UV-461	170 @ 2,600	226 @ 3,600
UV-549	208 @ 2,600	257 @ 3,400

INTERNATIONAL®

International Harvester Company
180 N. Michigan Ave., Chicago 1, Illinois

CONSTRUCTION EQUIPMENT

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors ... Self-Propelled Scrapers ... Crawler and Rubber-Tired Loaders ... Off-Highway Haulers ... Diesel and Carbureted Engines ... Motor Trucks ... Farm Tractors and Equipment.



1. HOW TO USE IT—At hole, 1 gal of fuel oil is poured over 100-lb bag of ammonium nitrate. Oil will coat prills.

2. GELATIN PRIMER—Continuous column detonator, usually 60% gelatin attached to Primacord, works best in small holes.

BLASTING AGENT SLASHES POWDER COSTS...

continued from page 130

relatively insensitive material, it is much more difficult to detonate than dynamite.

But its biggest drawback, as far as the contractor is concerned, is that it cannot be used in a wet hole. (Monsanto points out that this is seldom a problem in the Far West where ammonium nitrate has been used most extensively. They estimate that on a national average the number of wet holes encountered does not exceed 30% of the total drilled.)

But when conditions are right, ammonium nitrate can be a real money saver for the contractor who has a quantity of surface blasting to do for a big cut or to obtain rock fill.

One of the first contractors to substitute the ammonium nitrate-fuel oil mixture for conventional fixed explosives was the A. E. Burgess Co., Inc., of Birmingham, Ala.

Last fall Burgess blasted two big cuts containing more than 2,000,000 yd of rock on a road project near Birmingham. Before turning to ammonium nitrate, powder costs ran about 16 cents per cu yd for primary blasting, and a considerable amount of secondary shooting was necessary.

When Burgess switched to ammonium nitrate, powder costs were slashed to 4.5 cents per yd for primary blasting, and secondary blasting was eliminated entirely. This was because the low cost of the explosive made overloading of big holes practical. Blasting was done in laminated shale and slate. Holes were 6 in. in dia and 30 ft deep.

In addition to the low original cast of ammonium nitrate, Burgess realized a considerable saving in drilling and loading the shot material.

Because of its high gas yield, and because holes can be overloaded, ammonium-nitrate-blasted rock is easier to dig with draglines or shovels. Increased fragmentation means more cycles per hour, and on some jobs this has meant an increase of up to 10% in the yardage moved from the blast site.

Also, in almost every case where ammonium nitrate has replaced standard blasting agents, drilling costs have been lowered considerably. Powder costs are too high to permit overloading with conventional explosives. But ammonium nitrate is so cheap that overloading is standard practice. This means that spacing can be increased so that less holes are drilled. According to Monsanto, increased spacing can mean a saving of up to 20% in drilling costs.

Until now the contractor has preferred to shoot in small diameter holes. One main reason for this is that the smaller size explosives he generally uses lose much of their effect when shot in large holes. But the introduction of a bulky, low-cost explosive might eventually interest the contractor in bigger tractor-mounted, high-speed rotary drills. This can mean increased spacing and lower over-all drilling costs.

Developed At Strip Mine

Although ammonium nitrate has for years been the chief ingredient by quantity of explosives selling for several times its price, in its normal form it was not considered a true explosive. It had not been used alone as an explosive because it was known to have a low detonation rate, and this ordinarily means that its shattering effect would be insufficient. It was not until the early 1950's that the first practical ammonium nitrate explosive made its bow.

Powder costs have always been a major expense for strip mine

3. LOADING IS SIMPLE—Ammonium nitrate is simply poured down hole. This assures good confinement and high shatter.

4. DELAYED DETONATION—Powder man ties Primacord into trunk line. Delayed detonation system is used.

operators. In an attempt to reduce these costs, R. L. Akre, a superintendent of drilling and blasting at a large coal strip mine, began to experiment with ammonium nitrate, which was available in quantity and at a low price as a commercial fertilizer. His early tests convinced Akre that only slight processing would be necessary to make ammonium nitrate a prime explosive.

Two factors had to be overcome: the ammonium nitrate obviously needed a booster material to make it sensitive; and it had to be confined properly. Akre eventually solved these problems and developed Akramite, the first practical ammonium nitrate explosive.

Akramite, a patented product still used at some strip mines, at first consisted of ammonium nitrate in the prilled (crystallized) form and carbon black. Although Akre used carbon black as the sensitizer, any one of a number of carbonaceous materials, including lamp black, aluminum dust, or sulfur, was found to have the qualities needed to sensitize ammonium nitrate. But fuel oil was to prove the best sensitizer.

To solve the other problem—obtaining maximum confinement—Akre packaged the mixture in an expansible bag made of polyethylene. When these bags were dropped down the blast hole, they conformed with the sides of the hole, thus eliminating air pockets and producing excellent confinement.

This resulted in a shattering effect that was much better than could be expected in view of ammonium nitrate's low detonation rate. In a short time ammonium nitrate became a prime source of explosive energy for strip miners across the country.

About 2½ years ago, users began to pour loose ammonium nitrate directly down the blast hole without bagging it. This saved packaging and reduced costs still further. It also was about this time that users discovered that No. 2 fuel oil was a much better sensitizer and gas producer than carbon black or similar substances.

Besides being a better sensitizer, fuel oil has the added advantages of being readily available, cheap, and easy to use. It also does away with the need for mixing plants, which were required when a solid additive was used as the sensitizing agent.

Prilled ammonium nitrate comes in 50, 80, and 100-lb bags. The general practice is to distribute bags of ammonium nitrate around each hole and then to rip

Diameter of Hole (Inches)	Ammonium Nitrate (Lb per lin ft)
2	1.02
2¼	1.29
2½	1.59
3	2.30
3¼	2.67
3½	3.00
4	4.09
4½	5.17
5	6.39
5½	7.75
6	9.21
6¼	10.01
6½	10.81
6⅞	12.03
7	12.54
7¼	13.44
7⅞	15.79
8	16.40
8½	18.51
9	20.72
9½	23.12
10	25.61
10½	28.24
11	30.97
11½	33.88
12	36.89
12½	40.04

The above table is calculated using a density of ammonium nitrate of 47 lb per cu ft or 1.7 cu ft per 80-lb bag.

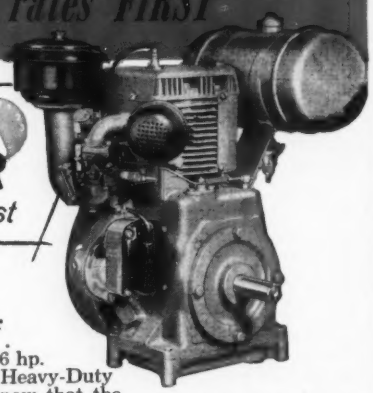
EXTRA SAVINGS—Excellent fragmentation, resulting from high gas yield and overloading of big holes, cuts cycle time for shovels and reduces cost of moving shot material from blasting site.

Kalamazoo Mfg. Co., Kalamazoo, Mich., is the builder.

Built by Creative Metals Corp., Emeryville, Calif.

WITH *Professionals* WISCONSIN-POWERED equipment *always rates FIRST*

Monroe Concrete Trucks, built by John's Mfg. Co., Grand Junction, Mich.



full-time **POWER** *at its best*

• Interesting fact! The great majority of the men earning their living in the construction field . . . *men in the know* . . . rely on 3 to 56 hp. equipment powered by Wisconsin Heavy-Duty Air-Cooled Engines. These men know that the percentage of profit often rides on the *rugged* dependability of the equipment working on the job. And they know, from actual experience, that Wisconsin Engines deliver this kind of dependability . . . *full time power* . . . day after day, month after month.

Wisconsin Engines are built by engine specialists. All skills and know-how are funneled in *one direction*, producing *only* one product . . . air-cooled engines, 3 to 56 hp.

"Down time" is cut to an absolute minimum when you specify equipment powered by Wisconsin Heavy-Duty Air-Cooled Engines. Local availability of parts and service through 2,000 service stations . . . several near you. Write for bulletin S-223, describing all models.

WISCONSIN MOTOR Corporation
World's largest builders of Heavy-Duty Air-Cooled Engines
Milwaukee 46, Wisconsin, U. S. A.

BLASTING AGENT SLASHES POWDER COSTS... continued

open the top of the bags so that fuel oil can be poured over the prills.

Monsanto recommends a ratio of 5% fuel oil to the weight of the ammonium nitrate. (About 1 gal of fuel oil to 100 lb of ammonium nitrate.) The fuel oil is poured uniformly over the top of the open bags and time is allowed for the oil to drain through to the bottom of the bag.

Some users prefer to pour 8 to 10% fuel oil by weight over ammonium nitrate because the bags sometimes absorb oil. It is a happy coincidence that if a bag is allowed to stand for 20 to 30 min, the prills will retain just the right amount of oil and the excess will drain off. But unless time is allowed for the excess to drain, the oil has a damping effect on the prills that might hamper detonation.

With the discovery that fuel oil worked well as a sensitizer of ammonium nitrate, another stumbling block—especially to its use in the construction field—was overcome. Early thinking on the use of ammonium nitrate and solid carbon additives limited this type of explosive to large diameter holes, with the optimum diameter being about 9 in. However, with a liquid additive in the form of fuel oil, and with proper priming (usually with a continuous column detonator), holes down to 2 or 3 in. dia can be shot with excellent results at considerable savings.

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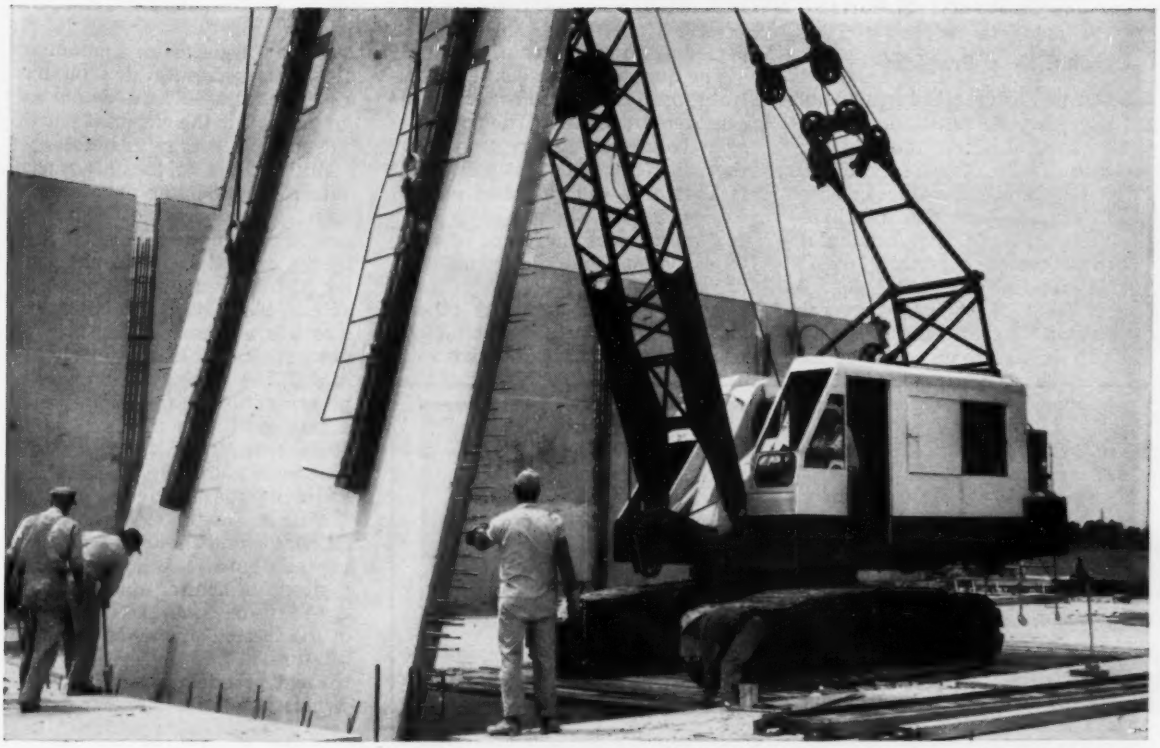

PUT A POLISHED TEXTURE like this on all surfaces of your precast concrete products every time by spraying your forms with Poco Soluble Compound.

NEW FORM LUBE BANS BUBBLES IN CONCRETE for 1/10¢ per sq. ft.

Exclusive Poco Soluble Compound assures smooth surfaces with polished texture on concrete work

Now you can eliminate air bubbles from surfaces of precast concrete products—even the underside of beams and channels—with a new form lubricant . . . Poco Soluble Compound.

It's the sure way to get smooth surfaces with a polished texture on all of your concrete work for an average cost of approximately 1/10¢ per sq. ft.

Just mix this exclusive Pure Oil product with water and apply to your forms with a pressure spray. A hand garden spray can be used for application providing air pressure is sufficient to properly mix the air and solution.

Contractors and concrete products manufacturers are mixing Poco Soluble Compound and water in various ratios from equal parts to one part of compound and six parts of water by volume.

Call your local Pure Oil representative today for full information on amazing new Poco Soluble Compound. He'll recommend the proper mixture for your operation and show you how it will increase the appearance and saleability of your concrete products.

PURE

Be sure with Pure

Detonation a Problem

An explosive acts in two ways to perform its function. It shatters hard objects through a sudden build up of pressure (based on its rate of detonation); it also shifts and loosens material (based on its gas yield). Ammonium nitrate became a practical explosive material when Akre discovered that if it were properly confined its shattering effect was much higher than could be expected from its detonation rate.

The quantity of ammonium nitrate's gas yield has always been considered excellent. The ratio of solid volume of the explosive to the volume of the gas it produces is known as the gas ratio of an explosive. As the gas ratio increases, so does the value of the explosive. Ammonium nitrate produces a larger volume of gas upon detonation than any other explosive material commonly used. Most commercial explosives have an 8:1 gas ratio; ammonium nitrate mixed with fuel oil has a 20:1 ratio. When detonated properly, it is the cheapest source of explosive energy available.

But because of the insensitive nature of ammonium nitrate mixtures, the problem of obtaining proper detonation has always been a critical factor in unleashing the explosive energy available in the material. Each explosive has a characteristic rate of detonation. If it is improperly initiated, the detonation wave can progress through the explosive at a rate much less than its maximum rate. This is particularly true with ammonium nitrate because of its insensitive properties.

This means that a high energy detonator must be used with ammonium nitrate and the proper quantity of booster must be present to insure complete detonation of the fuel oil-ammonium nitrate mixture.

Field practice shows that 60% dynamite or its equivalent makes the best initiating charge. Especially for smaller diameter holes, priming is generally more effective when a series of small charges, rather than one or two big charges, are used. This increases the shattering effect of the charge while maintaining a good rate of gas production.

Primacord, a cord of high explosive in a cotton or plastic sheathing, makes a good combination fuse and detonator for ammonium nitrate. Extra charges of high explosive, such as 60% gelatin dynamite, are put into the hole to insure that ammonium nitrate is detonated at its maximum rate. In this way, the shatter force of the ammonium nitrate detonated at a high rate breaks up rock, and the gas production displaces and loosens material.

For small diameter holes, Monsanto recommends a continuous column detonator, usually consisting of small sticks of 60% gelatin dynamite strung on Primacord. (Monsanto is also experimenting with short lengths of 400-grain Primacord attached to 50-grain Primacord by rubber bands.)

For a 30-ft deep, 6½-in. dia hole in hard rock, this would mean nine 1¼x8-in. sticks of 60% gelatin spaced at 1½-ft intervals on 50-grain Primacord.

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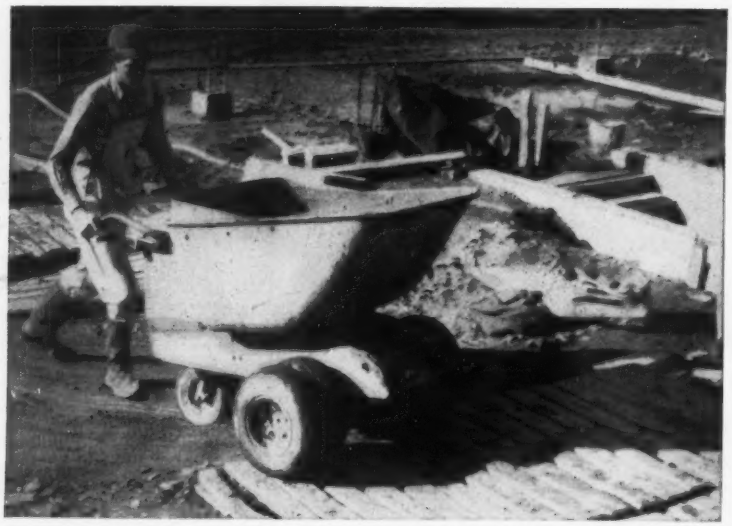


PRIME-MOVER M15A FOR BUILDING CONSTRUCTION Places 12 to 17 cu. yds. of concrete per hour on school, hospital and commercial projects — *without* extensive preparations for its use. Runs on same type of ramps, hoists and runways as hand carts. Available with flatbed, or 10 cu. ft. bucket.

M15A ▲
PRIME-MOVER
▼ M30

FOR HIGH VOLUME, LOW COST PLACING OF CONCRETE AND OTHER BULK MATERIALS — USE PRIME-MOVER POWER!

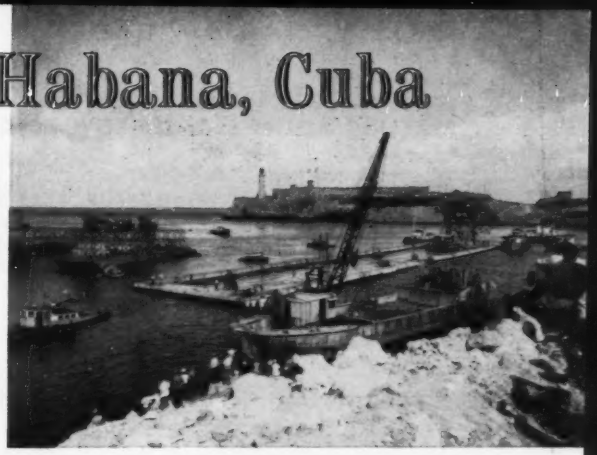
PRIME-MOVER M30 FOR ENGINEERED CONSTRUCTION

Hauls ⅔ yard or 1-½ tons. Unloads transit mixers fast. Spots concrete right where it's needed on plant, warehouse, pier and bridge construction. Hydraulic Torque Converter Drive frees the operator from shifting, clutching and wasted effort. Rugged, dependable. Bucket and flat bed.

FOR COMPLETE DETAILS WRITE TO PRIME-MOVER CO., MUSCATINE, IOWA

Tunel de la Habana, Habana, Cuba

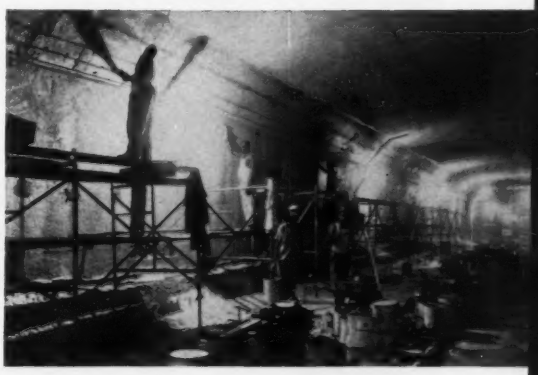
Remarkable engineering accomplishment, protected from water with the **Thoro System Products**

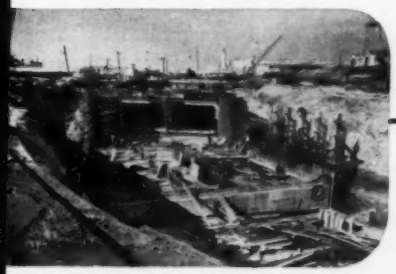


Four-lane, underwater tunnel, connecting Malecon Drive, City of Havana, Cuba with Guanabacoa near the famous Morro Castle, opening the sparsely-populated peninsula to residence and commercial activity.

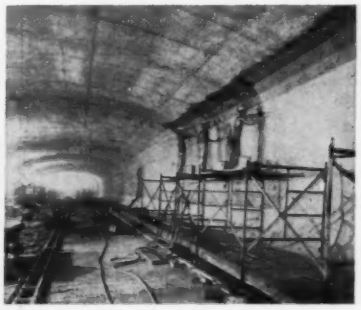
Mammoth precast concrete sections are floated to location by attached pontoons, lowered 24 meters under water and connected to previously-sunken sections. ***Note the famous Morro Castle. Top, center background.***

Design, engineering and construction by Societe des Grand Travaux de Marseilles, Paris, France, 733 Meters Long, 23 Meters Wide, 7 Meters High, cost $28,500,000.00. Waterproofed inside and outside with THORO System products, THOROSEAL, WATERPLUG and THORITE.





From Havana side, tunnel entrance grades down to harbor pool level.



Two double-lane tunnel sections take shape; forms will be filled with poststressed concrete.

Precast sections of tunnel, honeycomb patched with THORITE Patching Mortar and entire surface protected with THOROSEAL.

Thoro System Products applied, completes the job!

Preparing interior surface for WATERPLUG and one brush and one trowel coat of THOROSEAL. All walls, floors and ceilings are sealed with THOROSEAL.

THOROSEAL is being applied to all interior surfaces. Over 800 drums of WATERPLUG have already been used, where water was entering and where sections were joined together. All honeycomb and construction faults were sealed with THORITE Patching Mortar, before lowered to position in the bay.

Thousands of drums of THOROSEAL, WATERPLUG and THORITE Patching Mortar are being used on this vast project.

Write for literature "HOW TO DO IT"

Standard Dry Wall Products, Inc.

NEW EAGLE, PA. CENTERVILLE, IND.

Ammonium nitrate-fuel oil explosives work well when used in delayed detonation systems. The high gas production causes substantial breakage through the milling action of rock against rock. Unless a delay system is used, the gas is wasted in throwing instead of breaking rock.

Safe to Handle

One big factor responsible for the growing popularity of ammonium nitrate as an explosive agent is its remarkable safety. Most fixed explosives are shipped at a premium freight rate, but ammonium nitrate is transported at the standard rate. Fixed explosives must be stored in expensive magazines, but ammonium nitrate can be stored almost any place that is dry and out of the weather.

The hazard from sparks and cigarette fires is almost nonexistent with ammonium nitrate, and the danger of detonation from physical shock is eliminated.

Since fuel oil, the sensitizing agent, is added to ammonium nitrate only a few minutes before it is poured down a blast hole, the only real risk involved is in the handling of the detonator. Even this risk is reduced because the amount of easily detonated material at any blasting site—only the primer—is a fraction of the amount present when fixed explosives are used.

It is virtually impossible to detonate even a fairly large quantity of ammonium nitrate if it is unconfined. If a detonator is accidentally set off under unconfined ammonium nitrate, it would simply scatter it, or, at worst, the ammonium nitrate would burn. But extremely large quantities (100 tons or more) of ammonium nitrate can be detonated if the shock wave is of sufficient intensity.

Fight Fire with Water

If a mass of ammonium nitrate should catch fire, it should be flooded with cold water. Steam should not be used to extinguish the fire. Because gas pockets might build up and explode, and because burning ammonium nitrate can be toxic, men fighting an ammonium nitrate fire should be careful to keep as far from the flames as possible.

When large quantities of ammonium nitrate are to be stored, Monsanto recommends that bags be placed in several stacks with an adequate air space in between. A 2-ft passage between stacks will cut down the danger because fire can be brought under control more rapidly due to the cooling affect of the air passing around the bags. Monsanto recommends that quantities of 50 tons or more should be separated by at least 3 ft of space. Under no conditions should over 100 tons be stored in one place, Monsanto warns.

One Danger

There is one real danger present when ammonium nitrate is the blasting agent: the material is so safe to handle that men tend to get careless and forget that any explosive is unpredictable to some degree.

According to Monsanto, almost every accident can be traced directly to carelessness or thoughtlessness that could have been easily avoided if common sense precautions had been applied.

PROJECT STATISTICS

Exhibits Section:	**1,600,000 sq. ft.**
4 exhibit areas	100,000 sq. ft.
Storage space	90,000 sq. ft.
Banquet room	3,000 to 5,000 capacity
Arena Section:	**315 ft. dia. x 100 ft. high**
Seating	14,000 capacity
Over-all parking	2,850 spaces
Available floor space	51 acres

Project covers 17 acres of land

A.S.T.M. A325-55T*

WASHERS

when you need them!

Our ability to produce and deliver hard, flat and concentric washers made of prime stock to exact A.S.T.M. specifications has given us the privilege of taking part in the construction of Detroit's vast new Civic Center project.

Our reputation as a source for high strength construction washers on a direct basis to contractors and steel fabricators is growing every day. Standard sizes stocked for immediate delivery are: ½", ⅝", ¾", ⅞", 1", 1⅛", and 1¼". Save time and money, order high strength construction washers direct from the manufacturer.

*Hardness of 68 to 75 Rockwell A, and carburized to a minimum depth of .015". Quenched and tempered (non-carburized) washers have a hardness of 35 to 45 Rockwell C.

Write today for our newest price list on ASTM washer sizes available for immediate shipment.

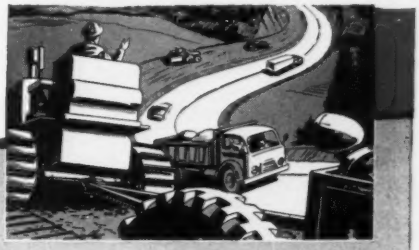
WHITEHEAD STAMPING CO.

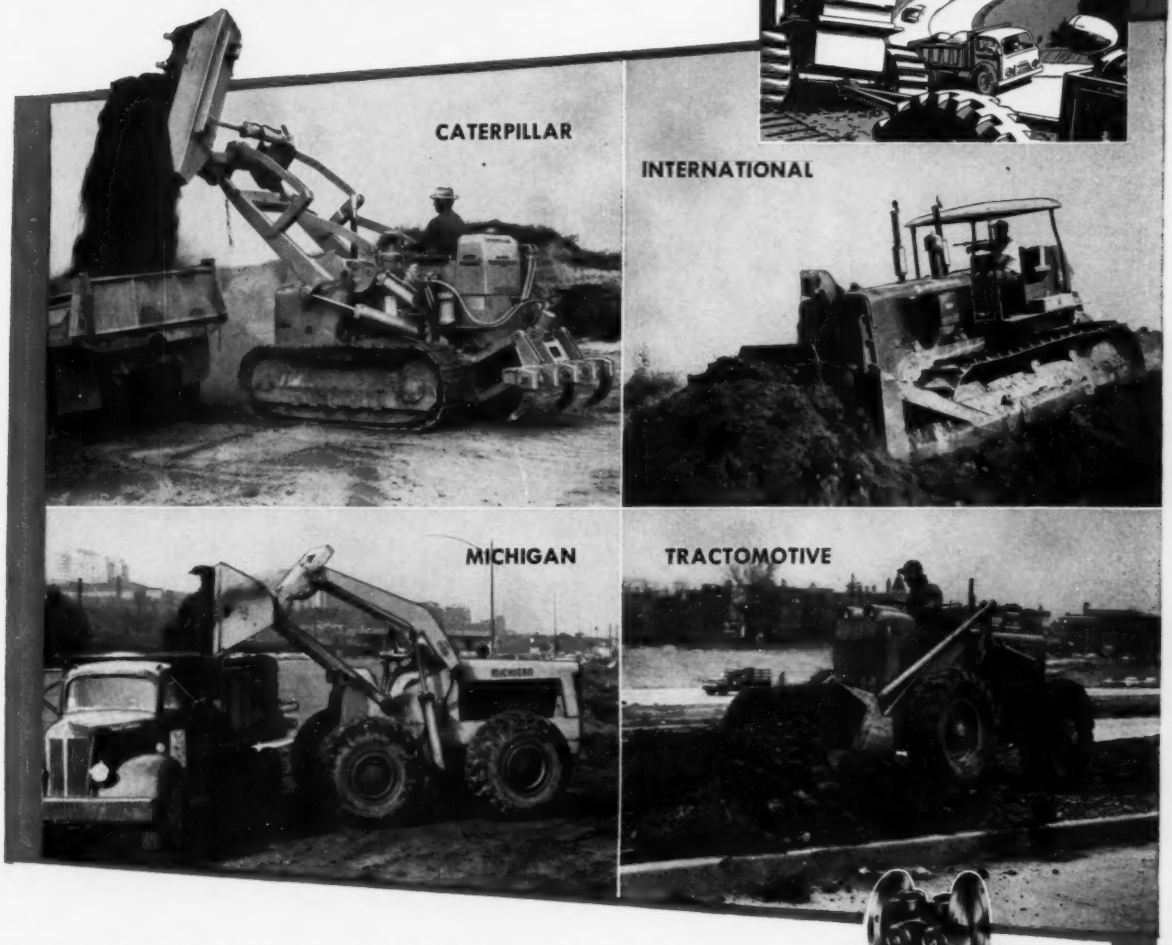
1661 WEST LAFAYETTE BLVD., DETROIT 16, MICHIGAN

WHITEHEAD

BLOOD BROTHERS Universal Joints

"get the power through" to make our highways come sooner . . .





It's a rough, tough, shock-and-strain life for the average 'dozer and loader. But machines like these are ready for it. Part by part, they've had long life engineered right in from the start.

Blood Brothers Universal Joints, for example, are one of the rugged, dependable components you'll find . . . selected for their field-proved ability to withstand punishment.

On these machines—and many other kinds of road-building equipment —Blood Brothers Universal Joints "get the power through" dependably. It's one of their vital functions to help make our highways come sooner.

If you build heavy-duty equipment, write for Bulletin 557—or call on our engineers for suggestions.

ROCKWELL SPRING AND AXLE CO.

Blood Brothers Machine Division

ALLEGAN, MICHIGAN

UNIVERSAL JOINTS AND DRIVE LINE ASSEMBLIES

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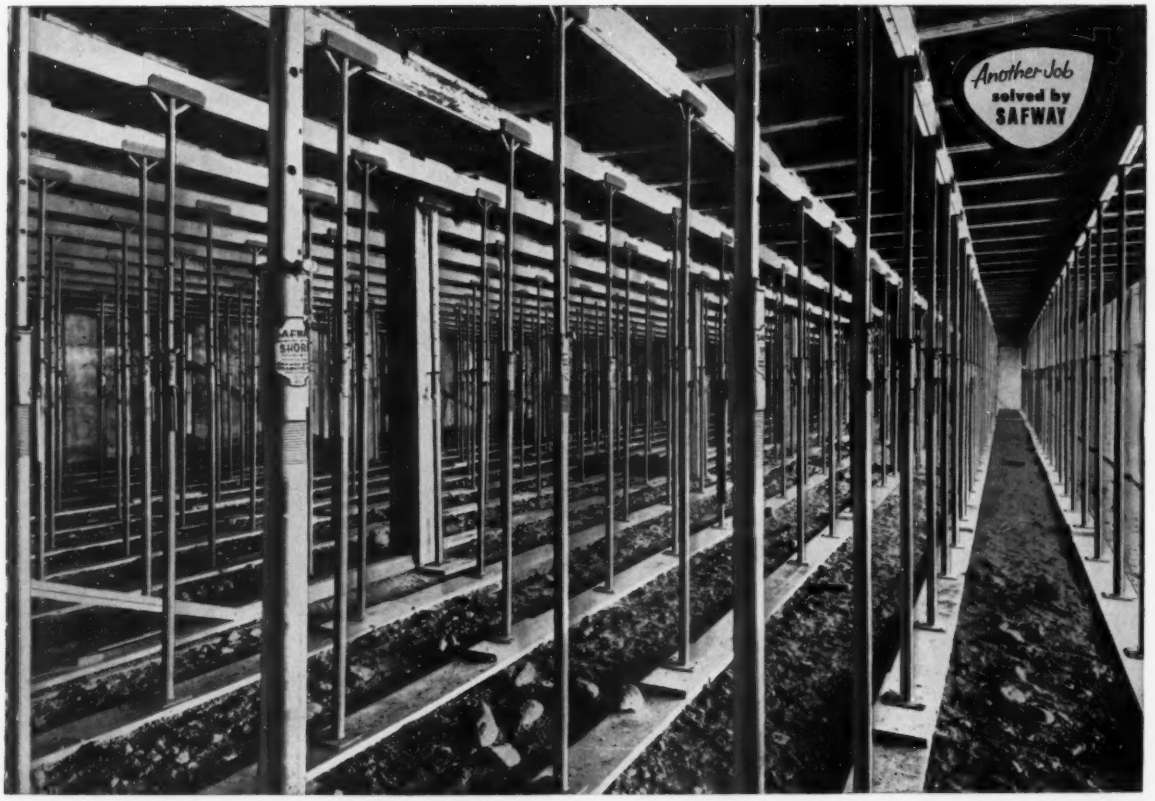
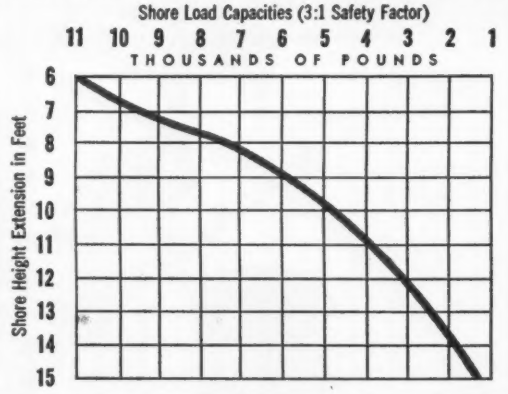


No shore bracing needed on new Rockford, Ill., shopping center job

1-Man Steel Shores Cut Pour Time by 1/5

It's Easy to Figure Your Jobs!

With this graph of shore capacities at various extensions, it is a simple matter to calculate your shore spacing and the number of shores needed:



SAFWAY ADVANTAGES MINIMIZE SETTING AND STRIPPING TIME; FEWER SHORES ARE REQUIRED

SAFWAY TELESCOPING SHORES can be set and stripped so fast that overall concrete pour time is reduced 20%, say many progressive contractors.

One man handles the entire job—carries, places and adjusts the shore. Rough height adjustment is set with a simple pin. Then fine adjustment is made by turning the threaded sleeve nut to exact fit. The U-shaped shore head seats 4 in. ledgers or 2 in. lapped lumber quickly and accurately without nailing. Bracing is unnecessary on most jobs to 12 ft. high.

Planning the job is speedy, too. After figuring the live and dead load and the ledger strength, you can easily work out the proper shore spacing. With Safway's high load capacity, fewer shores are needed.

Your nearby Safway dealer offers ample shore stocks for SALE or RENTAL . . . along with planning and erection service if desired. Find out how much time and money you can save on your next concrete job!

LEARN HOW YOU CAN SAVE!

Safway engineers will help you plan more efficient shoring that can increase your profits. Send job details for expert recommendations (no obligation). And write today for **FREE BULLETIN 23.**

SAFWAY
STEEL PRODUCTS, INC.
6243 W. State St., Milwaukee 13, Wis.

READYING A LOAD—Workman lashes cluster of pipe piles snugly between built-up sidewalls of modified Chevrolet 6100 dump truck that will carry them to driving site. Steel boots on piles (left) are designed to push aside stones during driving.

Two Ideas Simplify Pile Driving Job

A MODIFIED dump truck that carts 30-ft lengths of steel pipe piles from stockpile to pile driver, and a stone-diverting steel driving boot are speeding pile-driving on a section of the Northern Illinois Toll Highway.

Both ideas were worked up by Kiewit-Paschen-Cunningham, joint-venture contractors doing a 5-mi, $8.3-million stretch of the Tri-State Tollway—one of the three new highways that will make up the Northern Illinois Toll Highway.

K-P-C's contract includes construction of five concrete bridges supported by cast-in-place concrete piles. Pile shells for the job are L. B. Foster's 12 and 14-in. dia spiral weld steel pipe.

To move pipe rapidly from stockpiles to driving locations, the contractors sideboarded the body of a Chevrolet 6100 dump truck by welding on sections from the body of a salvaged dump truck. In operation, six or seven piles are pulled by crane up over the truck body to rest on the cab's headache rack. Two lengths of chain wrapped around both pipe and truck body keep shells from slipping from the truck during movement. The pipe piles nestle snugly between the built-up sidewalls. Simply raising the dump body unloads the pipe.

The steel driving boot is proving a handy solution for K-P-C to the problem of driving pipe through a gritty clay soil that is loaded with stones. The boot pushes the stones out of the way during driving and prevents pipe from bending, buckling, or splitting in the tough going.

Each boot consists of a 1-in. steel plate welded to one end of the pipe with two lengths of ¾-in.-thick steel ribs crossed over its face at right angles to push the stones. Boots are welded to the pipe ends in the stockpile yard.

A Vulcan No. 1, steam hammer mounted on a Northwest 80D crane swinging a 60-ft lead drives the pipe. Ready-mix trucks chute, 3,000-psi concrete directly into the pipe whenever terrain permits. When truck mixers can't move directly up to the piling, pouring is by crane and bucket.

The Northern Illinois Toll Highway actually is three highways in one. Longest is the 89-mi North Illinois Tollway that runs from the outskirts of Chicago to Rockford. Next in size is the Tri-State Tollway that runs from the Wisconsin state line parallel to Lake Michigan past Chicago toward the Indiana Toll Road. Finally, there is the 24-mi East-West Tollway that connects West Aurora with the southerly section of the Tri-State Tollway.

DRIVING PILES—A Northwest 80D crane swinging a 60-ft lead with a Vulcan No 1 steam hammer drives pile home while modified truck brings up a load of piles to work site.

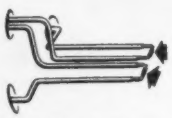
C.I.M. FLOODLAMPS are ALL-GLASS, give longer service life, more light, and don't grow dim!

General Electric's new floodlamp for Construction and Industrial Machinery is *all-glass*. This one-piece unit has no gaskets to leak. It is hermetically sealed so that dust, dirt and moisture can't get inside to scatter or dim light. Reflectors and lenses are a special hard glass that won't crack if splattered by rain or snow. There is no inner bulb to blacken—the whole unit is a bulb! Result: G-E C.I.M. Floodlamps *do not* grow dim.

Available in the 12- and 24-volt sizes, these lamps feature *two* single coil filaments *in series* instead of one long filament—and being shorter, the filaments are much stronger. These sturdy filaments are not welded to the lead-in wires . . . instead, they are clamped in a vise-like grip for added resistance to breakage. So filaments *stay* in focus.

What does this mean for you? It offers rugged-duty floodlamps that, when used in shock-mounted housings, will give a broad-beam spread, both vertically and horizontally, through any weather, for use on bulldozers, graders, scrapers, crawlers, or other road-building, mining and construction machinery.

General Electric makes a full line of all-glass sealed beam lamps for Construction and Industrial Machinery. Contact your nearby G-E Lamp Distributor or write: General Electric Co., Miniature Lamp Dept. CME-38, Nela Park, Cleveland 12, Ohio.



Two single coil filaments in series for greater strength

Vise-like grip adds resistance to filament breakage

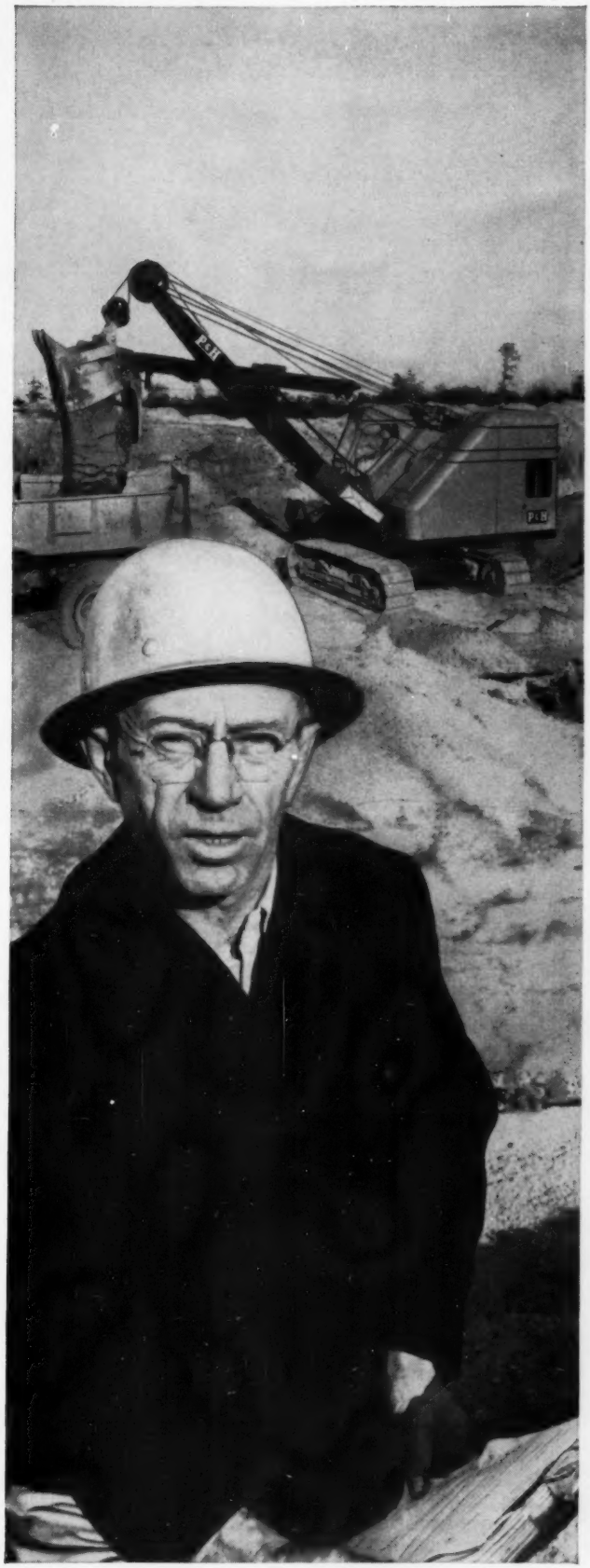
SPECIFICATIONS FOR G-E C.I.M. FLOODLAMPS

(PAR-46 Bulbs—2 contact lugs—5¾" dia.—500 hours designed life)

G-E No.	Circuit Volts	Watts
4478	12	60
4578	24	60

Progress Is Our Most Important Product

GENERAL ELECTRIC



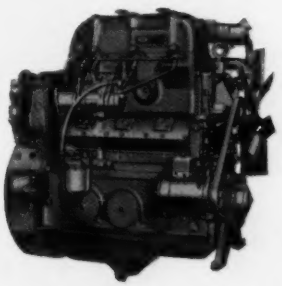
"Power to really dig in and do a day's work"

Mr. Wulf, general manager of Monmouth Trucking Company Sand and Gravel Pit, is enthusiastic about his P&H Diesel powered ¾-yard P&H 255A shovel. You hear reports like his everywhere about the P&H Diesel. It consistently makes good equipment perform better and results in less downtime for maintenance.

Until Harnischfeger developed the P&H Diesel, owners had to be satisfied with diesels which did not fully utilize all the potential of their equipment. But now, P&H Diesels have changed this situation with:

- **better response, faster starts, better idling than any other make of diesel**
- **delivers more power with less fuel—uses low-cost No. 2 diesel fuel**
- **25% fewer working parts and all wearing parts are interchangeable**
- **compact design results in easier maintenance—smaller parts stock**

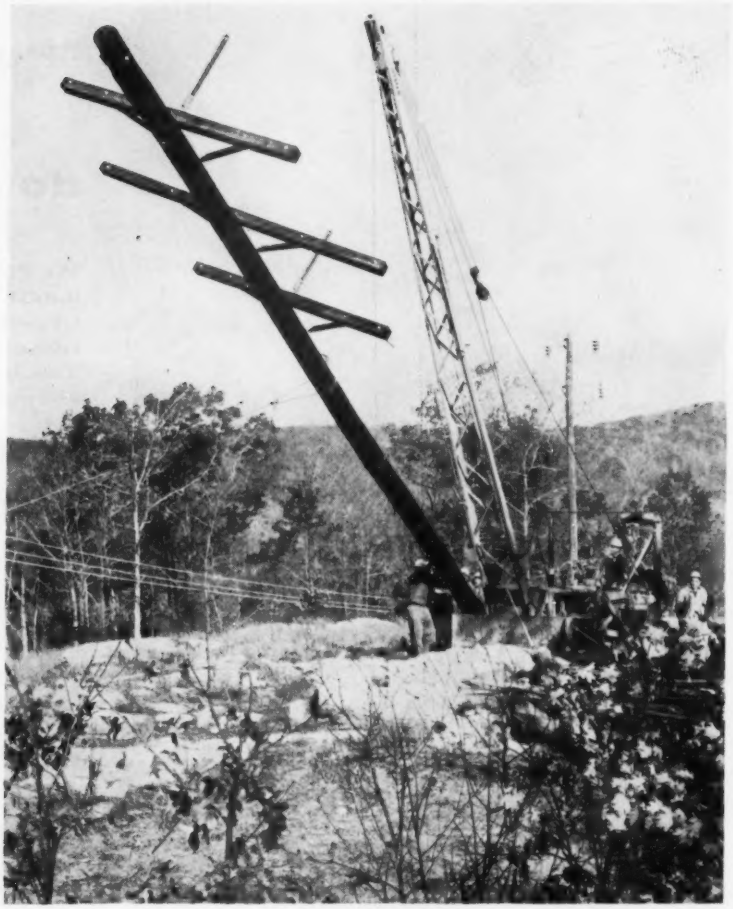
For all of your equipment—including crushers, front end loaders and other portable equipment—specify the one diesel with all the features that deliver top performance—P&H Diesel. P&H Diesel Engine Division, Crystal Lake, Illinois.



P&H DIESELS

Fastest Growing Name in Diesel Power

Mount a boom on a bulldozer blade, modify the tractor slightly, and you'll have a sturdy, stiff-leg crane that will prove job worthy.



HANDLES HEAVY LOADS—Caterpillar D4 with boom mounted on bulldozer blade lifts two-ton pole into hole while steel guy cable prevents pole from swinging.

EASY TO MODIFY—A section of pipe mounted above the winch provides leverage to raise the boom off the ground.

Converted Dozer Is Handy Crane

WANT A BULLDOZER that you can convert into a 28-ft-stiff-leg crane inside of 5 min? You can put one together simply by mounting a boom on a bulldozer blade. It takes only a slight modification of the tractor.

Orange and Rockland Electric Co. of Monroe, N.Y., took a boom that normally is mounted on the rear of the tractor and put it on a Caterpillar D4's bulldozer blade. Result was a handy tool that places two-ton power poles up to 70 ft long.

But besides placing power poles, the rig can prove worthwhile for any job where your tractor doesn't have the right weight distribution to counterbalance loads lifted with a boom mounted on the tractor rear.

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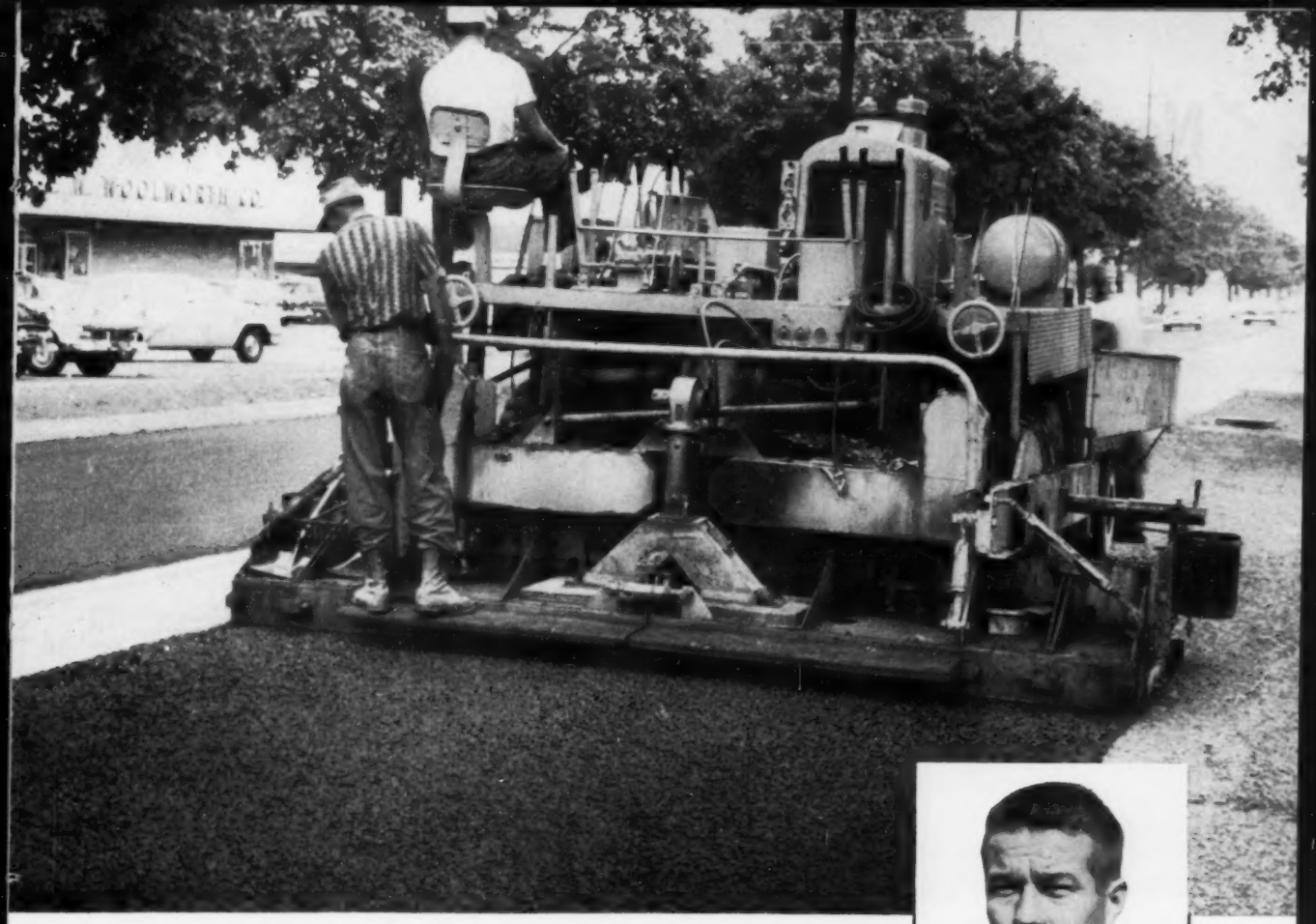

James "Pepper" Cunningham, partner, A. J. Cunningham & Sons of Trenton, New Jersey, found the speed of paving by the PF-90 one and one-half times faster, with less downtime, minimum maintenance costs.

"Everything about the Blaw-Knox unit has been engineered for speed"

That's how James "Pepper" Cunningham feels about his 12-foot Blaw-Knox PF-90 Paver. The former stock car and midget auto racing champion says the maneuverability and speed of the PF-90 helped his crew maintain schedules in spite of two-way continuous traffic while resurfacing 3100 feet of Parkway Avenue, a heavily-travelled artery in Trenton, New Jersey.

Rubber tires on the PF-90 were a big time-saver. They made it possible to get back and run a new lane faster. Levelling was changed instantly in the case of a small dip. The operator adjusted the depth of the binder instantly instead of a 10-foot run experienced with a previous machine before repositioning. In addition the two-speed tamper made it possible to match tamping to travel speed.

Big capacity fuel tanks for the screed heater and engine helped to keep the PF-90 operating for 10 hours without refuelling stops. The screed heater got underway faster, heating the binder to 300°F. in 15 minutes. Simple, easy to operate controls, independent for each operation, made for higher rates of production. Mr. Cunningham says this is equivalent to saving lots of downtime, especially in city paving operations.

In three months the Cunningham organization experienced no downtime, and only one hour each day was required for lubrication and refuelling. Outstanding performance and speed from high capacity machines like the PF-90 can help build your profits. Your Blaw-Knox Distributor has all the details. Why not check with him soon?

BLAW-KNOX

BLAW-KNOX COMPANY

Construction Equipment Division

38 Charleston Avenue, Mattoon, Illinois

New...Low Cost...Portable Ellicott Dragon*

easy to move from job to job...by truck or rail ...matched-marked parts for rapid field assembly

The new Ellicott 8" Dragon Model Dredge is a compact, high performance dredging unit. Like all "DRAGONS," this unit can be used for a variety of jobs . . . puts the outstanding economy of hydraulic dredging at your disposal for projects like road building, plant pond clearance and mosquito control. Or, for profitable development of new real estate from low-cost marginal land.

- **One Power Source** – 6 cyl. diesel engine with 142 shaft h.p. continuous rating powers Ellicott 8-inch heavy duty centrifugal suction pump, supplies power for hydraulically-actuated cutter and winch motors.
- **Rated Output** 85 cu. yds. per hour over 1,000 ft. pipeline.
- **Cutterhead and Ladder** dips as low as 17 feet below surface for fast, efficient digging of soft materials like sand, mud or silt.
- **2-Piece Hull** easy to transport and reassemble.
- **Heavy-Duty 8" Centrifugal Suction Pump** is simple, efficient, trouble-free.
- **Steel Spuds** "walk" the dredge through canals or waterways as work advances.

Learn how the new Ellicott 8" DRAGON can help you do more jobs better . . . at greater profit. Write for full information, today.

*T.M. REG. U.S. PAT. OFFICE MARQUE DÉPOSÉE

ELLICOTT MACHINE CORPORATION

1605 Bush Street, Baltimore 30, Maryland, U.S.A.

Subsidiaries: Dragues Ellicott France, Paris, France; Ellicott de Mexico, Mexico City, Mex.; Ellicott Fabricators, Inc., Baltimore, Md.; McConway & Torley Corp., Pittsburgh, Pa.; Baltimore Foundry & Machine Corp., Baltimore, Md.

Successors to the floating dredge business of the Bucyrus-Erie Co. and the American Steel Dredge Co. Complete engineering sales and repair parts service.

4440

Laying one course of the 7½-inch Texaco Asphaltic Concrete foundation on US Route 301 in Sussex County, Va.

Contractor
Adams Construction Company
Roanoke, Va.

What type Asphalt pavement for Interstate Highways?

Virginia supplies one answer to that question on the new northbound lane under construction on 11 miles of US Route 301. The most heavily traveled north-south truck route across Virginia, US-301 is part of the new Interstate Highway System.

The foundation for this important project consists of a 7½-inch thickness of coarse-graded, plant-mixed Texaco Asphaltic Concrete, laid in three courses on an 8-inch subbase of selected borrow material. The wearing surface is plant-mixed Texaco Sand Asphalt, laid to a compacted thickness of 1½ inches.

This is one of a number of heavy-duty asphalt pavement designs suitable for Interstate Highway traffic.

Asphalt highways are equal in durability, lower in average upkeep cost, superior in riding quality and *cost substantially less* than rigid highways having the same load-bearing capacity. The important savings afforded by Asphalt become more and more vital to highway officials and motorists, as a result of currently rising road building costs.

The existing asphalt pavement on US-301 will be the southbound lane of the new, divided Interstate Highway.

Section of the Plant-Mixed Texaco Sand-Asphalt wearing surface on new, northbound lane of US-301.

Helpful information on methods and materials recommended for all types of Asphalt construction for highways and streets is provided in two free Texaco booklets. Copies may be obtained without obligation by writing our nearest office.

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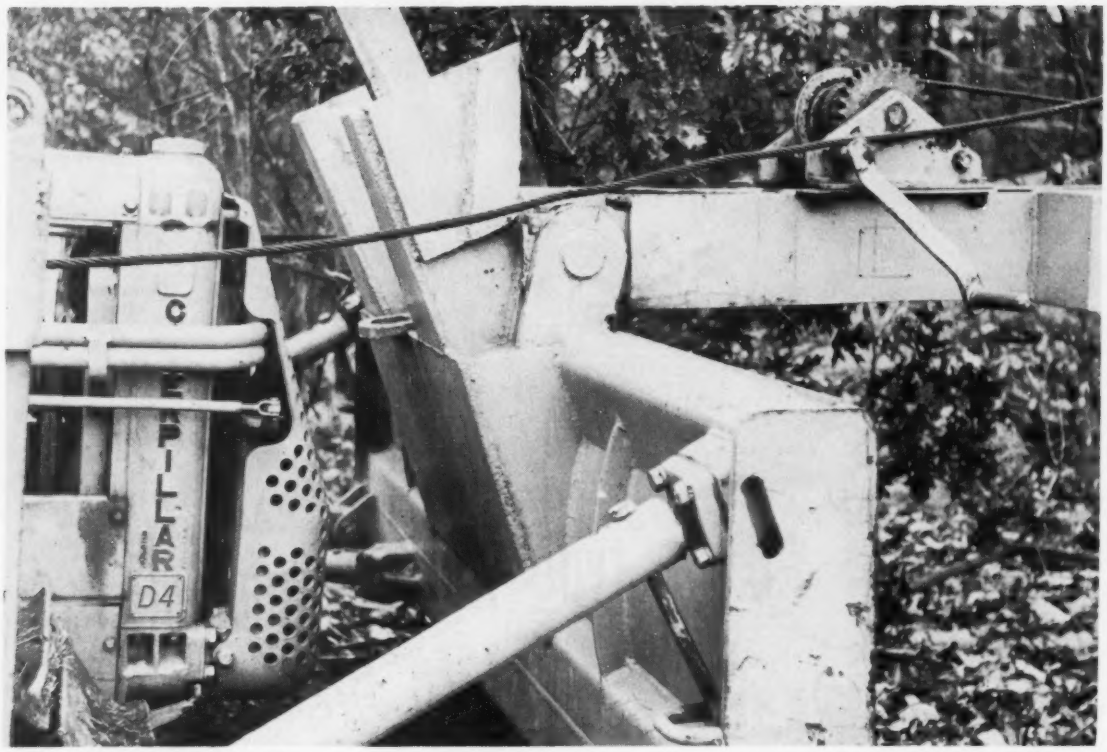
TEXACO ASPHALT

CONVERTED DOZER IS HANDY CRANE . . . continued from page 146



BLADE MOUNTING—Welding a box section of 1-in. steel plate to the back top center of the bulldozer blade supports mounting trunnions. Heavy steel stops prevent the boom from crossing center and accidentally falling back over the body of the tractor.

Minor modifications to the tractor adapt it to the blade mounted crane. Welding a box section of 1-in. steel plate to the back top center of the bulldozer blade supports mounting trunnions. Heavy steel stops prevent the boom from crossing center and falling back over the tractor. Two brackets carry the cable from the standard Hyster winch on the rear of the tractor to the boom.

A section of 6-in.-dia steel pipe mounted 5½ ft above the winch, and attached to 6-in. steel channels on each side of the winch, provides leverage to raise the boom off the ground and to carry the cable clear of the operator. Two 3-in. angle irons crossed between the sides reinforce the frame, and braces of 3-in. pipe anchor the frame to the tractor.

A sheave mounted between two 1x3-in. steel bars 4 ft long controls the winch cable at the base of the boom. Bars are based on the bulldozer blade and pivot fore and aft, keeping the cable near the base of the boom to prevent side drift.

One long guy wire anchored on each side of the tractor to special pads on the bulldozer trunnion mountings provides side support for the boom. The guy passes through a traveling sheave that is controlled by a second wire passing through a sheave at the top of the boom and down to a hand winch at the base of the boom.

To raise the boom, the hoisting cable is deadended at the boom's base. The boom then is raised by power winch, and the hand winch is engaged to take up the slack in the guys, locking the boom in elevated position.

It takes only 5 min. to install or remove the boom. Removing one bolt on each side frees the boom from its trunnions. U-bolts attach the guys to the bulldozer trunnion mountings. Once the boom is removed, the bulldozer blade can be operated normally. Regular trunnion mountings on the winch are retained to permit mounting the boom on the rear of the tractor when desired.

The power company had H. O. Penn Machinery Co., Inc., New York City Caterpillar distributor, work up the demountable boom when it found its tractor with the boom mounted on the rear did not have the right weight distribution to counterbalance the heavy poles it had to place.

This is how the power company works the rig for placing poles. Pole holes first are blasted in the site's hard seamed granite and sandstone. Two jackhammers with 2¼-in. bits and powered by a 600-cfm Schramm compressor drill blast holes 6 ft deep into the rock. Each hole then is loaded with up to 12 sticks of Du Pont 40% Gel dynamite. Holes are blasted in three lifts to prevent damage to the parallel 33,000-v lines. Two steel mats covered by heavy boulders contain each blast.

The D4 snakes in a pole complete with crossarms. The boom then is installed on the tractor and raised, and the D4 moves up to the hole. The winch cable is attached just above the balance point of the pole, and the pole is raised to stand on its base.

One man guides the butt into the hole, and the pole is lowered into position. The pole then is braced with long pikes, and the D4 backfills the hole.

A-W portable tandem roller, owned by Pittsburgh Asphalt Driveway & Paving Co., rolling binder layer of asphalt.

"Our Austin-Western can take the hills and does a great job of finish rolling"

says Mr. Joseph A. Laudato, Owner, Pittsburgh Asphalt Driveway & Paving Co.

Moving in reverse, on same job.

Pittsburgh Asphalt Driveway & Paving Co., Pittsburgh, Pa., specializes in driveway construction and maintenance—does anything from private home driveways to supermarket parking lots.

Bought portable tandem roller

Mr. Joseph A. Laudato, owner of the company, bought a new A-W tandem roller in January, 1957. His purchase was based on his previous experience with other A-W rollers, plus his confidence in the local distributor. Mr. Laudato says: "We use the A-W primarily to put the finish layer on asphalt, and it does an excellent job of giving it a smooth, fine level surface. The machine worked fast, too. On one job, a supermarket driveway, we finish rolled 6,300 yards of asphalt in an 8-hour shift."

Likes climbing ability

"One of the things I like best about the Austin-Western," Mr. Laudato states, "is its climbing ability. This is hilly country and a roller often has to work on a very sharp incline. To do a good job, the roller has to have steady power, otherwise you get an uneven, wavy surface. Driveways always come out smooth when our Austin-Western's on the job."

Maintenance extremely low

"To date," Mr. Laudato continues, "maintenance costs have been practically zero. You can put me down as a real Austin-Western booster."

The Austin-Western portable tandem roller is variable between 3½ to 6 tons. Tandem rollers are available in 5-8, 8-12, 10-14 ton models; 3-wheel rollers in 8-11, 10-12, 12-14 ton models. All A-W rollers are powered by your choice of gasoline or diesel engines, 4-speed or 2-speed transmissions, and torque converter. See your nearby A-W distributor. Or write us for complete information.

Austin-Western CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.

BALDWIN · LIMA · HAMILTON

Power graders • Motor sweepers • Road rollers • Hydraulic cranes

BALDWIN BLH LIMA-HAMILTON

"a ticklish job... demanding pin-point control"

Says **Del Newell,**
Job Superintendent, TOWNSEND AND BOTTUM, INC.

Working side-by-side, two Manitowoc 60-ton cranes placed 142 ft. long trusses 100 feet high at the Dan E. Karn Power Plant of the Consumers Power Company project near Essexville, Mich.

"Although hampered by constant winds blowing off Lake Huron—sometimes as high as 40 mph," Mr. Newell said, "The team of Manitowocs, equipped with 120′ booms and 30′ jibs, lifted the heavy trusses to the 100′ height, held, walked and positioned them to the point where the steelworkers could bolt them into place. Since the structural unit was too large for the men to move, they depended entirely upon the crane's precise controls to line up the bolting holes."

Ticklish jobs like the Dan E. Karn project are everyday jobs for Manitowocs. Equipped with torque converter, the precise lifts are smooth and fast . . . operators have easy, fraction-of-an-inch control, yet never lose the "feel" of the machine.

The unusual stability of these cranes contributes to the ease of making high, heavy lifts, as well as to the safety of such lifts. A low center of gravity and balanced design, give the unit extremely solid footing and equal load distribution.

There is a Manitowoc for every construction job . . . your distributor can give you details on the full range of Manitowocs and show you units that will make your jobs easier and more profitable.

Manitowoc

MANITOWOC ENGINEERING CORP.
MANITOWOC, WISCONSIN

CRANES	SHOVELS	DRAGLINES	TRENCH HOES
20 TON - 100 TON	1-YD. - 5½-YD.	1-YD. - 6-YD.	1-YD. - 2½-YD.

INCREASE YOUR PROFIT,

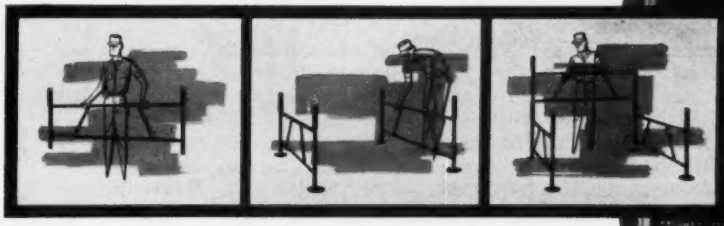
PRESTIGE AND POTENTIAL

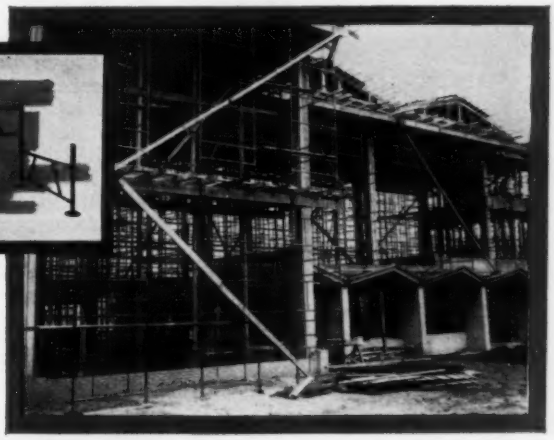
in the Construction Industry...with

Brainard's 4S Engineered Shoring System

Brainard's 4S Engineered Shoring System was designed to fulfill a need in the heavy construction industry for a quick, simple and inexpensive method of shoring up concrete slabs in all kinds of industrial and commercial structures. There has long been a need in the construction industry for a *simplified* shoring system—*safe, sturdy* and one that could be erected with *speed*. Brainard's Engineered Shoring, the 4S System, meets all these requirements.

Brainard's system is composed of a minimum number of parts designed for all shoring applications. All parts can be reused. It has combined strength and versatility, with ease in handling for simplified and speedy erection. Brainard's Shoring System can save substantial construction money for you.





Brainard's Engineered Shoring System is delivered to the job site in components and can be quickly erected by one man. Save time and money with Brainard.

A few select franchises are available for qualified distributors interested in handling this profit line. Write to

Brainard Specialty Products

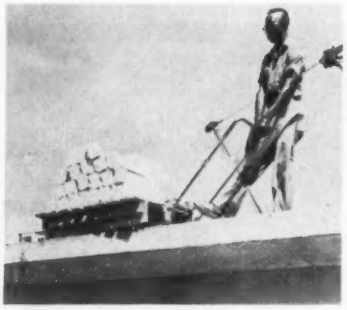
493

SHARONSTEEL

Brainard Steel Division, Sharon Steel Corporation
Griswold Street, Warren, Ohio

WORKING AHEAD—Pallet-loads of masonry materials are hoisted to a floor and trucked to a central location where they are stacked to await arrival of masons working floor below.

Hand Trucks Keep Masons Busy



WITHIN REACH—Truck spots pallet load on work floor edge when masons are ready.

HAND TRUCKS feed palletized masonry materials and supplies to masons during "bricking-up" of the $20-million Carillon Hotel in Miami Beach, Fla.

Materials come to the job stacked on skids that first are stockpiled by fork lift trucks on street level. When needed on a floor, fork lift trucks take the materials from storage to a hoist that carries the loads to the proper work floor.

There, four half-ton Yale Zephyr hand trucks pick up the skids and carry them either to a work area on the floor or to a centralized storage point. Hand truck deliveries to central storage points usually are made late in the day or on Saturday to supply an entire floor with correct amounts of cement block, gypsum block, fire brick, ventilating blocks, and other materials such as bagged cement.

When masons begin work on the stockpiled floors, the trucks take on the job of distributing materials to position where masons need them. With some 20,000 sq ft of floor space on each deck, hand trucks permit Cal Kovens Construction Corp., the contractor, to increase his mason gang while cutting down on his labor gang.

The hand trucks carry the loads normally carried in wheelbarrows by laborers. Reversing the manpower ratio gives the contractor considerably increased production in proportion to a slightly increased cost of masons' wages over laborers' wages.

Trucks are shifted from floor to floor during construction or split between masonry crews on different floors. This assures a steady flow of materials to workmen at all times.

Some typical loads carried by the trucks include 45, 8-in. regular building blocks; 180 to 200 of 3-in. lightweight cement partition blocks; 240 fire bricks; 90 gypsum blocks for partitions; and 90 louvered ventilating blocks.

4-in-1 outloads "single-action" rigs...

gives 4-machine utility, to boot!

Using Skid-Shovel action—the operator takes time-saving advantage of fast exclusive pry-over shoe break-out action and 42° ground-level roll-back to heap the bucket. Then he uses exclusive non-spill parallelogram lift action to "keep the heap all the way up." This 1½ cu. yd. International Drott 4-In-1 loads up to 120 cu. yd. of bank run gravel per hour—for excavating contractor, Roy M. Wright, Springfield, Mass.! "Can't be matched by any other rig," operator declares!

Cashing-in on earth-rolling bulldozer action, as well as all three other big-capacity actions, Gradyville Services, Inc., Gradyville, Pa., clears, excavates, and grades a 4-acre tract for a trailer park—beats a fleet of old style, limited-duty rigs. "The tractor has plenty of power to handle all 4-In-1 actions," states Operator George Johnson!

Employing carry-type scraper action with inch-close accuracy, this TD-14 4-In-1 provides speedy, labor-saving sub-grading action. Note how the clam lip is regulated to let the earth "boil" in! In addition, this 4-In-1 removed old concrete, and bulldozed—on this Rea Construction Company job, near Rockville, Md.

Putting space-saving clamshell action to work on clean-up, this TD-14 4-In-1 shows how you can practically eliminate costly "hand-shovel-wheelbarrow" methods—get increased job-getting earning power from your loaders. The clamshell fills itself in one fast gulp; gives positive, self-cleanout bottom dumping. Owner: C. W. Atkinson & Sons, Columbus, Ohio.

Move the "machine-selector" lever—compare 4-In-1 versatility and capacity to any "single-action," dip-and-dump loader. See how 4-In-1 multiplies your profit range by four. See your International Drott Distributor for a 4-In-1 demonstration.

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin

INTERNATIONAL® DROTT®

These TD-24 full-time

let you run power circles

Exclusive, all-weather, seconds-fast International gasoline conversion starting. Direct combustion heat conditions the TD-24's engine, seconds-fast—for full diesel performance. You avoid the warm-up delays and service complications of a surplus starting engine—earn money while "slow starters" are warming up!

Exclusive International Cerametallic-faced engine clutch action. The TD-24 is the only king-sized crawler with this big feature. Immune to heat and cold, this long-lasting clutch gives full-load power-transfer efficiency—anywhere, anytime! This dry-type clutch of simplified design eliminates "high frequency" servicing demanded by clutches with "cooling systems."

Exclusive, years-proved Planet Power steering. Why put up with load limiting "dead track drag" on the turns in a king-sized steering clutch crawler? Why not profit from TD-24 Planet Power steering that enables you to pull or push as big a load on the turns as on the straight-away? See how TD-24 two-track turning power never backs off from a load. "Take the turn" to new profits with Planet Power steering!

Exclusive cycle-speeding on-the-go shifting. In either Torque-Converter or Gear-Drive model, the TD-24 gives instant stall-preventing Hi-Lo shifting, without stopping or even declutching. Fingertip matching of speed to load under full power gets the job done sooner!

Exclusive TD-24 fingertip operating ease provides the operator comfort incentives and the means to give full days of full capacity cycle-speeding production!

Find out how these and all the other TD-24 production exclusives can equip you to run power circles around anything else on tracks. See your International Construction Equipment Distributor for a TD-24 demonstration!

Planet Power steering and Hi-Lo "power-crowd" keeps the TD-24 loading the "75" Payscraper® at top effective speed—adds up to increased daily yardage. Only 30 to 45 seconds needed to heap-load a "75" Payscraper—on this Dominic Leone Construction Co., Inc., Colorado road job!

production exclusives

around "cycle-stallers"

Even with such offset loads as a boulder-bucking angled blade—benching a road round a hill—TD-24 Planet Power steering lets you concentrate the power where you want it. You stay on course—production stays up!

On slam-bang rock-dozing or moving other heavy materials, instant TD-24 Hi-Lo shifting adjusts tractor power to load resistance —increases production, avoids delay! And you get fast reversing to speed shuttle-dozing!

INTERNATIONAL® CONSTRUCTION EQUIPMENT

International Harvester Co., 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

Rock-speeding Payhauler® features hit schedule-beating pace.....

ON US 27

The three-unit "65" Payhauler fleet of Greer Brothers and Young, highball 2,000 cu yd of rock 1,200 feet daily. Rock-moving climbed 'way ahead of schedule, on this U. S. 27 relocation job near Lincoln, Kentucky!

Both Payhauler sizes—the 18-ton "65", and 24-ton "95"—have built-in, schedule-beating performance!

Exclusive high reverse and "zip-around" power steering gives a Payhauler regular "pick-up truck" spotting ease. The "big-target" Payhauler body speeds the shovel's dip-and-dump cycle.

Load-matched and road-matched turbo-charged diesel power gives these heavy-duty, off-highway haulers super-fast get-aways. Next-to-automatic Payhauler control gives safe, capacity-adding speed—even over rough terrain! The "65" can roll at 36.4 mph; the "95" at 38 mph!

And the double-acting hydraulic hoist, *under full controlled power both up and down,* contributes cycle-speeding 10-to-12-second Payhauler dumping!...Extra speed on every job-phase adds up to extra profit-tons hauled!

See how a Payhauler on your job will give you a decisive, profit-margin of difference! See your International Construction Equipment Distributor for a demonstration!

Find out for yourself *all about* all the big-money-making Payhauler features. Send for your free copy of this new, fully-illustrated Payhauler catalog!

International Harvester Co.
180 N. Michigan, Chicago 1, Ill.

Gentlemen:

☐ I am a contractor. ☐ Am interested in becoming a contractor. ☐ Am an equipment operator (please check square that applies.) Send me Payhauler Catalog (CR-603-G)

Name_____

Street Address_____

City_____ State_____

INTERNATIONAL® CONSTRUCTION EQUIPMENT

International Harvester Co., 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

Now! A Complete, Compact Service Station on a Two-Wheel Trailer!

ALEMITE
REG. U. S. PAT. OFF.

on-the-job

Power Lubrication Rig

OFFERS 3 BIG SAVINGS!

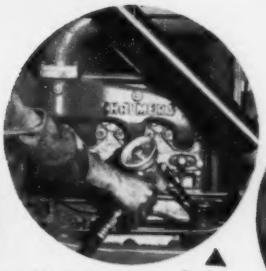
1. Save Time—bring lubrication right to the job, safely, efficiently! *2. Save Money*—cut lubrication downtime! *3. Save Equipment*—give the added protection of positive power lubrication!

The compact new rig shown here is just one example of how Alemite can furnish you a "custom-made" unit that fits your exact needs. Does the *complete* job! Shown equipped with the following standard Alemite products:

- **Air-operated high-pressure lube gun.**
- **Air-operated gear oil pump.**
- **Loader pump for refilling hand gun.**
- **"Big-A" Bucket Pump.**
- **55-gal. air-operated motor oil pump.**
- **Bank of 4 hose reels, including high-pressure, air, gear lube and motor oil lines.**
- **Standard air compressor.**

Fast, easy, high-pressure lubrication of all bearings equipped with hydraulic or button-head fittings!

Quick filling of final drives, gear housings, transmissions!



No engine oil wasted—delivers exact amount of oil required!

Air line equipment for on-the-job tire inflating, air cleaning!

ALEMITE
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Division of STEWART-WARNER CORPORATION

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Please send me complete information on the newest Alemite Portable Service Stations and Alemite equipment. No obligation, of course.

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"Don't raise the bridge, boys... LOWER THE RIVER"

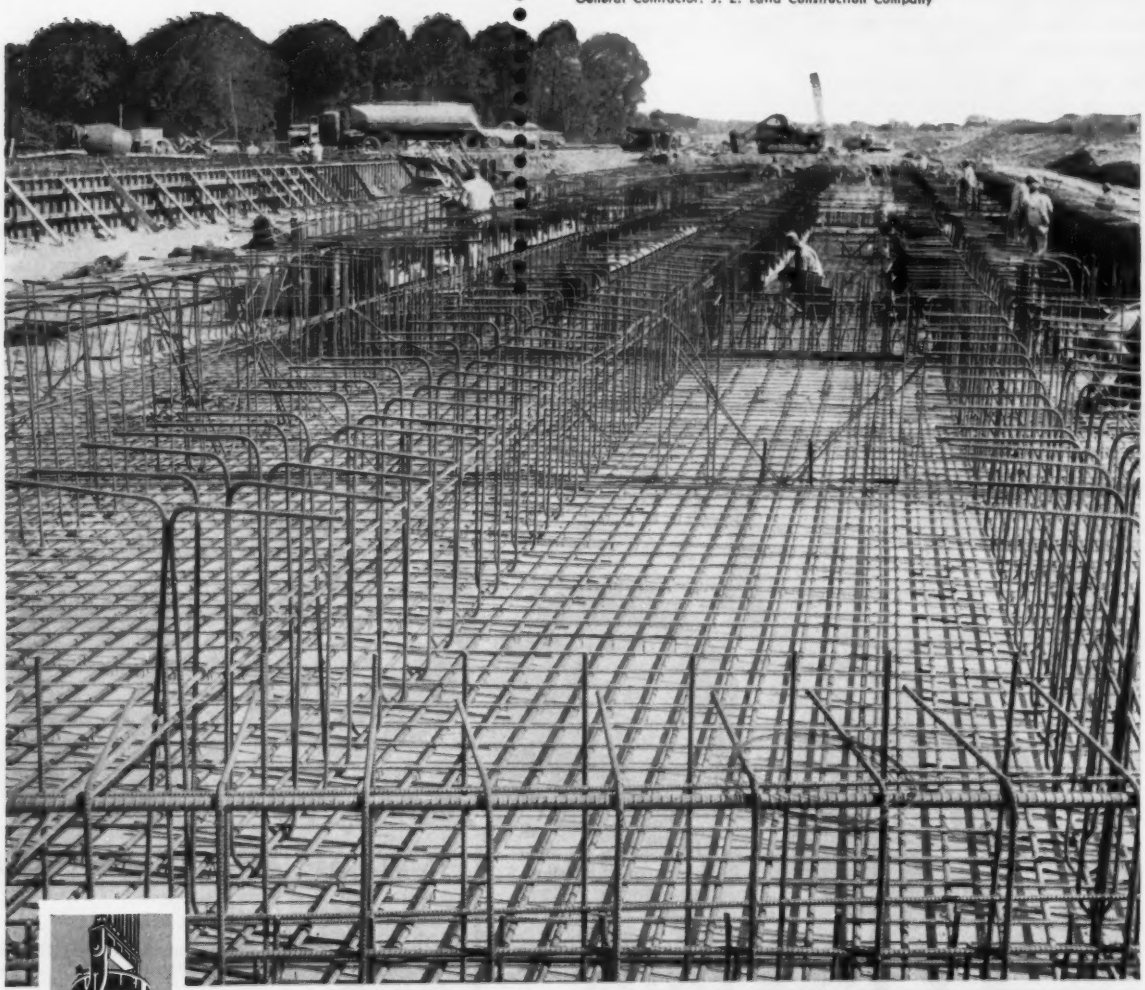
This favorite punch line of the old music hall comedian actually becomes a reality in the case of this new Highway 40 bridge which is being built right on the ground. Concrete pillars for the bridge are being poured into holes in the ground.

After bridge construction is complete, an underpass will be cut under the bridge. Only then will this unique structure really become a bridge.

FOR ALL HIGHWAY CONSTRUCTION, LACLEDE MAKES THESE STEELS:

- *welded dowel spacers*
- *multi-rib round reinforcing bars*
- *center joints*
- *tie bars*
- *recess joints*
- *accessories*

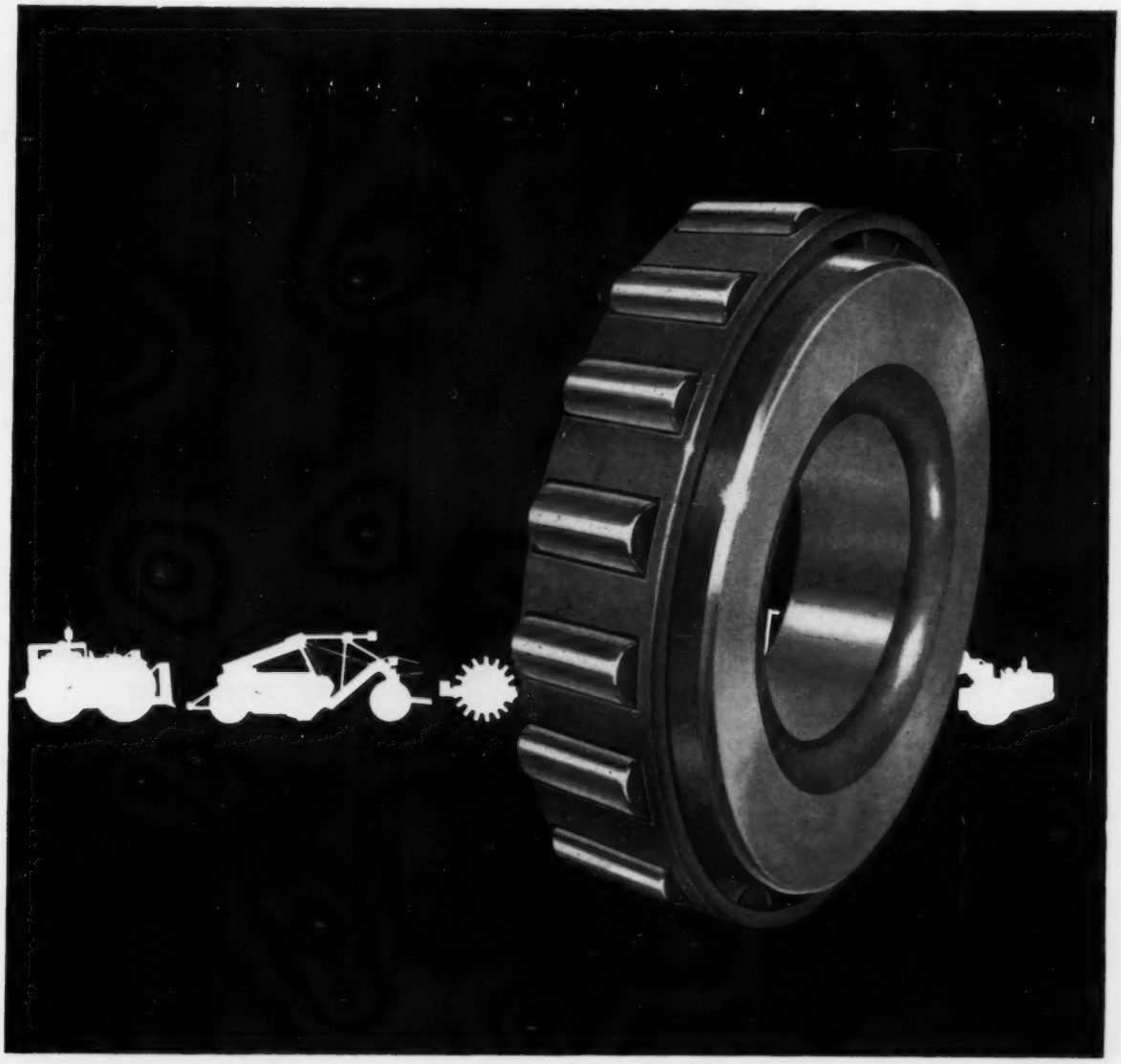
Missouri State Highway Commission
General Contractor: J. E. Latta Construction Company



LACLEDE

LACLEDE STEEL COMPANY

SAINT LOUIS, MISSOURI ◆ Producers of Steel for Industry and Construction



one grease assures quality, convenience, economy

The performance of Esso Multi-Purpose Grease H equals or excels that of many "special-purpose" greases in all types of equipment—in such points as spring shackles, wheel bearings, track rollers, universal joints, steering linkages, water pumps. This has been proved by contractors in all phases of construction work.

Esso Multi-Purpose Grease H takes the severest punishment encountered by hard-working earth-moving and construction equipment. It *maintains* a highly effective protective seal around exposed bearings preventing contamination by water, mud, dust and dirt.

And Esso Multi-Purpose Grease H offers great cost-cutting advantages in handling and inventory since it takes the place of three or more greases. On-the-site applications are quicker and simpler. What's more, there's never the danger of using the wrong grease and causing costly damage and down-time.

For specifics on how Esso Multi-Purpose Grease H can bring big savings to your operations, call our nearest Esso Office. Esso products and services are available through Esso Standard Oil Company plants and offices in more than 400 cities and towns throughout New England, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, W. Virginia, the Carolinas, Tennessee, Arkansas, Louisiana and the District of Columbia.

PERFECTED BY RESEARCH

MULTI-PURPOSE GREASE H

Esso

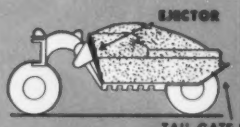
PROVED IN PERFORMANCE

FROM ST. LAWRENCE SEAWAY TO CALIFORNIA

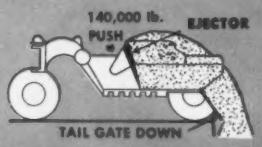
YUBA Movall

Dumping glue-like clay on St. Lawrence Seaway. "Better than any other hauling unit for this type of work" says contractor.

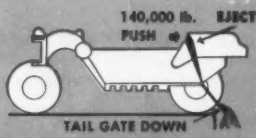
Accurately spreading surfacing material in fifth gear at Mather Air Base, California. No tractor or motor grader was used.



LOADED — The big target, big capacity body carries its load low, maintaining high ground clearance since frame and body are integral and compact.



DUMPING — Level body offers no gravity resistance, with potential 140,000 lb. ejector push assuring complete positive discharge with minimum use of power.



EMPTY — Sides and bottom are scraped clean, eliminating need for "mucking out" or decreasing capacity for next full load. Complete ejection takes only 11 to 14 seconds.

This rugged multi-purpose high speed hauler outperforms rear-dumps and bottom-dumps on most every type of off-highway job

Earthmoving that only a MOVALL can do at such high profit

Exclusive level action positive ejector spreads surfacing material on the fly, completely unloads sticky clay or any top loading material. Full stability during all operations, high clearance, short turning radius, big capacity, and less downtime mean *more profits* on *more types of jobs.* See your Allis-Chalmers, Caterpillar, or International Harvester Dealer – or phone or write Yuba direct. *Now is the time.*

MA-803

YUBA MANUFACTURING DIVISION

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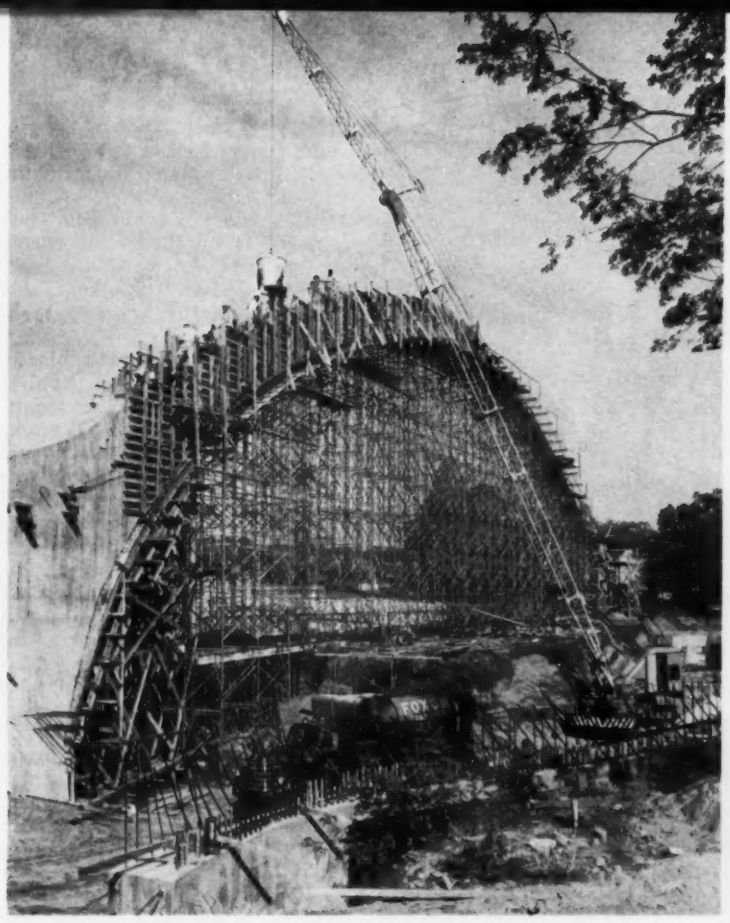
YUBA CONSOLIDATED INDUSTRIES, INC.



ANCHORING SCAFFOLDS—Guy wires anchored to concrete side walls prevent lateral movement of tubular scaffolding towers while P&H crane buckets concrete into forms.

crown. It rests on heavy concrete buttresses carried down to bedrock.

To build the foundation Macomber first had to lower the water table to bedrock 35 ft below grade with a Moretrench wellpoint system. Then, 10 ft of rock had to be blasted out so that two 12x18-ft concrete spread footings 10 ft thick could be placed at each end of the arch. A 10x12-ft concrete buttress over each footing was poured to a height of 24 ft. Each was raked at a 30-deg angle to the center of the structure to take the thrust of the arch legs.

Work on the arch proper created the problem of how to shore, form, and concrete the difficult structure. The best answer to the shoring problem seemed to lie in the use of adjustable tubular steel scaffolding.

"The tubular scaffolding figured to be economical," said Jack Leslie, job superintendent. "And we could adjust it to the curvature of the arch."

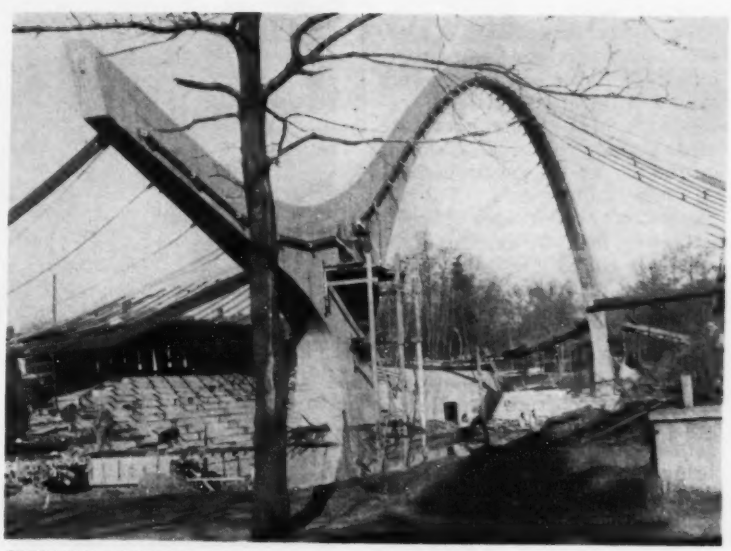
Timber falsework shored the first 21 ft of arch on each side. Leslie then put Patent Scaffolding's "Trouble - Saver" ladder scaffold units to work. For a distance of 32 ft in from each 21-ft point, Leslie erected 410 frames 2 ft wide into 2x5-ft tubular tow-

Scaffolds Support High Forms

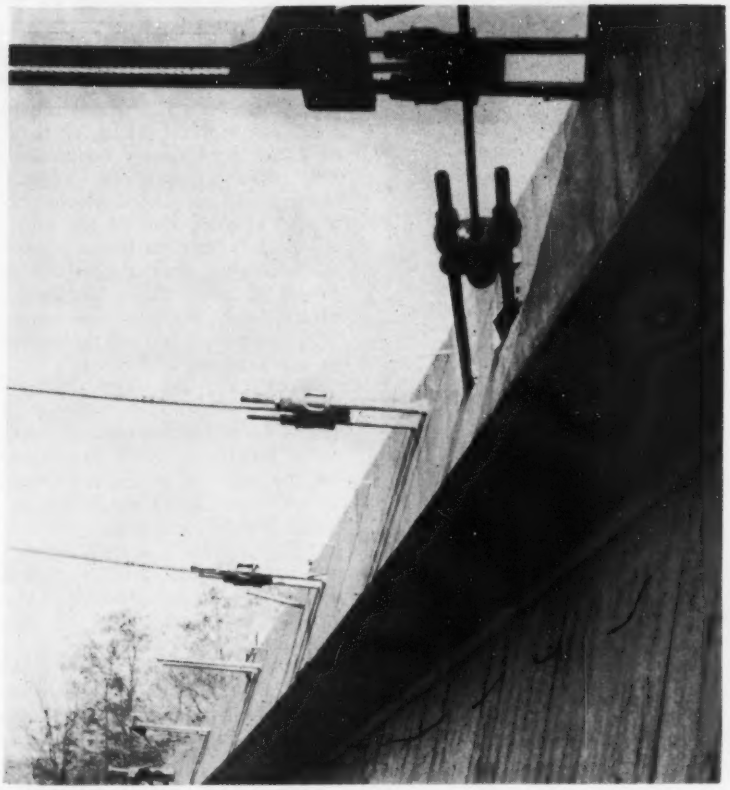
ADJUSTABLE tubular scaffolding provided an economical answer to the building of a 70-ft-high concrete arch that forms part of an unusual structure at Yale University in New Haven, Conn.

The building is the $1.2-million David S. Ingalls Ice Hockey Rink. Its concrete arch runs the 240-ft-length of the building and is flanked on each side by a parabolic concrete girder set on a concrete wall. A network of steel cables connects the arch and the parabolics and supports tongue-in-groove wood roof planks. Though the whole job is unique, the arch construction for contractor George B. H. Macomber of Boston proved the biggest headache.

The arch is 4 ft wide and 9 ft deep at the base and narrows to 3 ft wide and 5 ft deep at the



STRINGING CABLES—Steel cables strung from arch to parabolic girders set on concrete walls are crossed with additional cables to form basket weave that will support roof.



ANCHORING WIRES—Roof-supporting cables are anchored to studs cast into the parabolic concrete girders. A small hand winch helps fix the cables at a predetermined sag.

ers to required heights. Towers stood 2 in. apart. (The site previously had been a parking field with asphaltic concrete covering. A portion of the paving was left untouched as foundation for the towers.)

For the remaining 59 ft of arch, 475 frames 5 ft wide were combined to build 4x5-ft towers spaced 8 in. apart. Heights varied to form the rough curvature of the arch. Threaded T-heads on the tops of the towers permitted fine adjustments. Patent's "TubeLox" cross braces connected tower legs. A system of 56 steel guy cables anchored to outside walls of the building braced the shoring against lateral movement.

Leslie set up a second series of towers to serve as work platforms from which concrete forms could be set. Forming itself was a rather delicate job. Leslie first bridged the adjustable T-heads of the scaffold tops with 4x8-in. timber stringers. Two parallel rows of 8-ft lengths of 2x8's then were crossed over the stringers and cut to the curve of the arch. These curved joists were bridged with 2x8-in. planks to form the soffits.

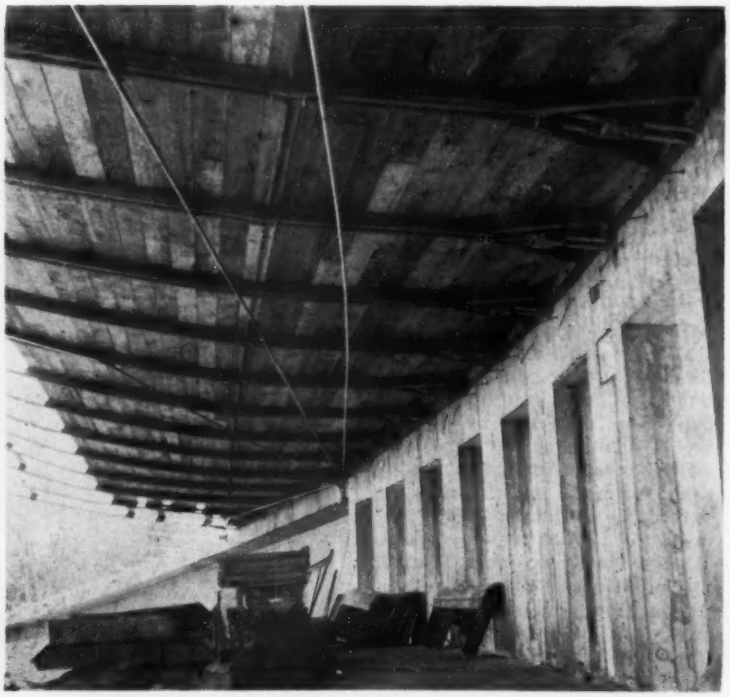
Side forms were made from 1x6-in. tongue-in-groove sheeting studded and waled by 2x4's. Richmond form ties kept side forms properly spread and secure.

Reinforcing next was placed, then 4,000-psi concrete supplied by transit-mix trucks and handled by bucket and a P&H crane.

A system of cables that would support roof boarding planks was run from the concrete arch to the parabolic ring girders. Each side of the arch anchored 55 Roebling bridge strands of 15/16-in. dia placed on 6-ft centers along the arch at a predetermined sag. A small hand winch helped pull the cables to desired sag.

An additional 18 cables of 15/16-in. dia were placed transversely across the 55 cables on each side to form a basket weave that carries the roof covering. Three heavy 1¾-in. cables placed over the smaller cables at quarter points on the arch and anchored into the side walls brace the arch.

Roofing consists of tongue-in-groove wood deck panels that were placed from the side walls on up to the arch.



PLACING ROOFING—Roof cables run from parabolic beam to arch to support tongue-in-groove roof panels. Electrical conduit network cuts through beam and fans out under roof.

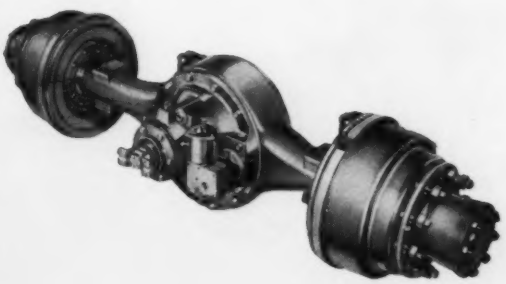
IN EATON 2-SPEED AXLES

REDUCES STRESS AND WEAR

ADDS TO AXLE LIFE • CUTS MAINTENANCE

KEEPS TRUCKS ON THE JOB • LOWERS OPERATING COST

Eaton's exclusive planetary construction distributes gear-tooth loads over four "planet" gears, holding stress and wear on any one gear tooth to a minimum. Completely locked out in the high speed range, these four gears rotate only slowly in the low speed range. The result is quiet operation, easy clash-free shifting, minimum wear, materially longer axle life. This rugged planetary design, plus forced-flow lubrication enables Eaton 2-Speeds to establish outstanding performance records. Eaton 2-Speeds also reduce stress and wear on engines and all power transmitting parts; they make it possible for trucks to haul more, quicker, longer, at lower cost.



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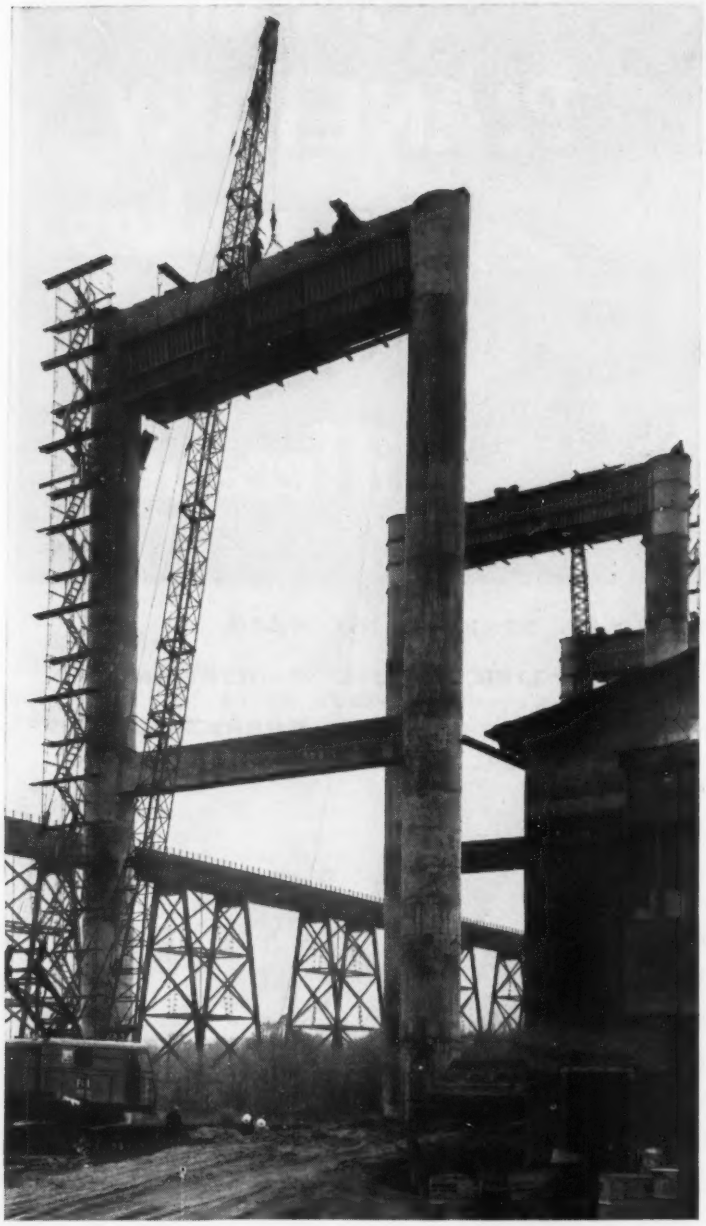
Blaw-Knox Steel Forms cut costs on 135-foot high bridge piers, were used without falsework



22-ton steel cap form hoisted into place by crane with 160-ft. boom. Blaw-Knox Steel Forms were re-used an average of 27 times on the project. Note the absence of falsework and cross girders.

When Johnson-Kiewit, joint-venturers on the new mile-long Hudson River Bridge south of Albany, were faced with the construction of 42 concrete piers they chose Blaw-Knox Steel Forms for a fast, economical job. To form the pier columns, they used 320 lineal feet of 8-ft. diameter column forms fabricated in 5-ft. lengths by 180-degree segments.

As pouring progressed, the forms were supported on the work by special anchor bolts cast into the concrete. After a 20-ft. lift was complete, the form assembly bolts were loosened along the vertical joints and the form was hoisted to rest on the previously set anchor bolts. This operation was repeated as the columns were built up.

Strut forms for intermediate and cap beams weighing 22 tons were lifted into place by crane and supported entirely on the work. This required a variation of the standard column form which was equipped with a collar on which the beam form rests. These forms were anchored to concrete with 1½ in. bolts and special Blaw-Knox-developed shear blocks to transmit the heavy loads to the concrete columns. This arrangement framed into the end of the strut form so that the column and strut were poured monolithically.

Throughout the project, designed by Madigan-Hyland, the need for expensive cross girders to support the heavy strut and cap forms was eliminated. The Blaw-Knox Steel Forms, easy to set and strip, made possible as many as 27 re-uses.

No matter what your concrete project, bridges, dams, tunnels, sewers or prestress units, it will be to your profit to contact the Blaw-Knox Steel Form Consultation Service. There is no obligation. Contact us early in your planning for a profit-building engineering contribution.

BLAW-KNOX

BLAW-KNOX COMPANY

Blaw-Knox Equipment Division • Steel Forms Department
Pittsburgh 38, Pa. — STerling 1-2700

There is no fussing with time consuming hoists and wire rope to spot this drill.

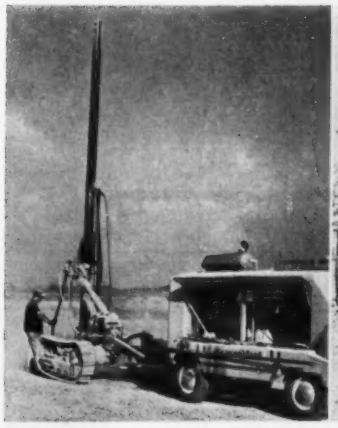
The big savings are in speed of set-ups and maneuverability. Set-up time is not production time.

Convenient controls, reverse and release rotation make for fast and easy steel changes.

the NEW Ingersoll-Rand CRAWL-IR MOST FULLY MECHANIZED CRAWLER DRILL EVER DEVELOPED

No other crawler drill is so fully powered — so fast and easy to setup — so safe and convenient to use. It will drill horizontally, vertically, or at any angle, with all boom and tower motions controlled hydraulically at the touch of a throttle.

The CRAWL-IR tows its own air power up slopes or over rough terrain. Heavy duty air motors propel the rugged knee-action crawlers. Call your I-R man or write for bulletin 4189.



The CRAWL-IR is not dependent on other equipment and men to move its air power—it tows its own.

Here is a graphic example of complete flexibility—toe holes out over the side of the crawler.

Sound design, convenience of controls and rugged construction give you all you could ask for in a crawler drill.

a Constant Standard of Quality

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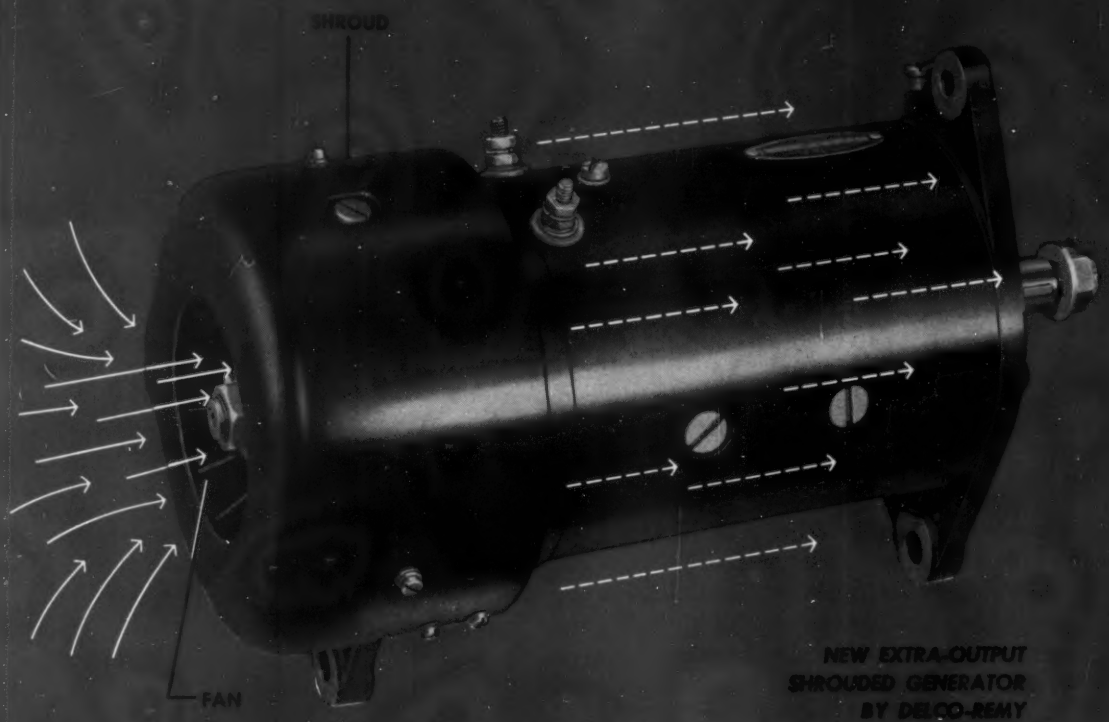
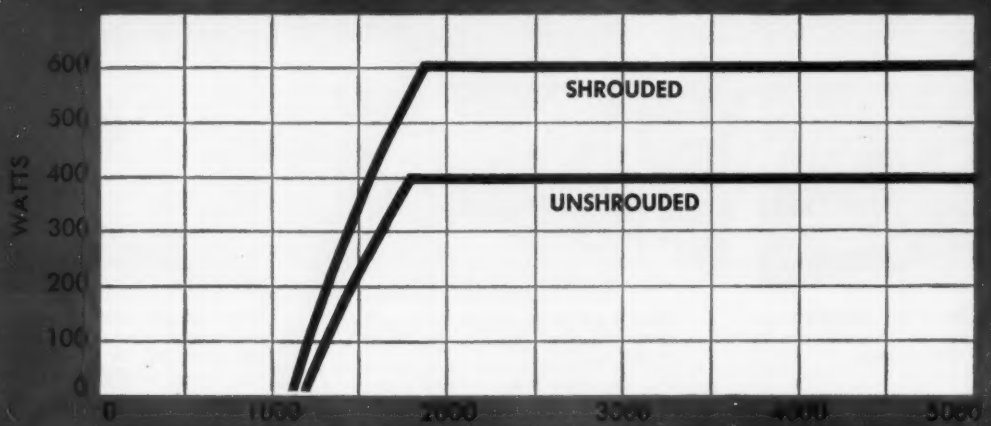
FOR A PACE-SETTING DRILLING COMBINATION, POWER THE CRAWL-IR WITH A GYRO-FLO COMPRESSOR.

PROGRESSIVE ENGINEERING MAKES THE DIFFERENCE



NEW EXTRA-OUTPUT SHROUDED GENERATOR BY DELCO-REMY



COMPARABLE OUTPUTS OF ENCLOSED GENERATORS WITH AND WITHOUT SHROUD

NEW DELCO-REMY TOTALLY ENCLOSED GENERATORS OFFER 50% MORE OUTPUT WITHOUT INCREASE IN SIZE

Delco-Remy's new, totally enclosed shrouded generators offer up to *50% more* output than former enclosed models of this size. They are especially designed for construction vehicles and off-the-road equipment subject to extremes of dust and moisture, or corrosive materials. Because they are totally enclosed, they are *splash-proof* and *dust-proof*.

Key feature of the new units is a high-efficiency fan mounted at the commutator end in a compact, formed steel shroud. The shroud-controlled air blast travels closely along the generator frame where it produces rapid and effective cooling . . . makes possible up to *50% more output*, without the added cost of increased frame size.

For every kind of heavy-duty operation, Delco-Remy generators provide greater power and reliability with long life. Be sure to specify Delco-Remy shrouded generators—where required—for your new equipment. Readily available in 6-, 12-, and 24-volt models for replacement application on present equipment through the United Motors System.

DELCO-REMY • DIVISION OF GENERAL MOTORS • ANDERSON, INDIANA

GM GENERAL MOTORS

GENERAL MOTORS LEADS THE WAY—STARTING WITH

Delco-Remy

ELECTRICAL SYSTEMS

TRESTLE-RIDING DRIVER—Raymond Concrete Pile Co. set up a rig with a 70-ft jib on a trestle in the building's excavation to drive piles the full width of the building.

DEPTH CHECK—Workman shoves hammer away from shell to check depth.

Equipment Planning Makes Jobs Go Fast

Contractors on two Washington, D.C. building jobs select their equipment to meet specific needs. The trouble pays off in fast and efficient driving of concrete piles on one job and six-a-day concrete caisson placing in the other.

CRAWLER-MOUNTED BORER—Mounting a Caldweld caisson-boring rig on crawlers permits digging caisson holes in hard-to-reach spots even while excavation is under way.

EQUIPMENT selected and modified for fast, efficient handling of the specific job is proving a good investment for two foundation contractors in Washington, D.C.

Raymond Concrete Pile Co. is driving 1,200 concrete piles 55 to 60 ft long with a big, trestle-riding rig they put together for the foundation of a $2-million, six-story first phase of what will be an $80-million addition to the House Office Building.

And Eisenhart Foundations, Inc., of Pensauken, N. J., has two earth-boring rigs mounted on trucks and a third on crawlers to dig 1,023 caissons with 4 to 12-ft dia up to 78 ft deep for the $37.4-million State Department Building.

On both jobs the equipment meets specific needs. On the House job, Raymond, subcontractor to Gunnell Construction Co. of Washington, D.C., must drive piles fast. An old masonry sewer that ran through the center of the 51x221-ft building site about 20 ft below grade temporarily had to be relocated. It later will be rebuilt into the new foundation. The sooner piles are driven the sooner the sewer can be rebuilt.

continued on page 174

TRUCK-MOUNTED RIG—Borer mounted on truck gives the contractor mobility.

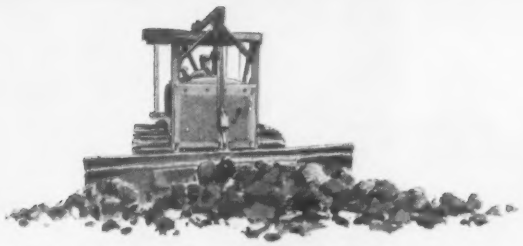
"FINEST PERFORMANCE FOR 56 YEARS!
WE'LL STAY WITH STANDARD"

ON-THE-SPOT *technical service,*

products that never fail

keep Palumbo Excavating Company buying STANDARD

FUELS *and* LUBRICANTS



In 1901 Joseph Palumbo found that Standard Oil lubricants worked best to keep the horsedrawn wagons rolling smoothly. Later, in 1920, his son Samuel Palumbo founded Palumbo Excavating Company. For 56 years Standard Oil Company has satisfied the company's every petroleum need.

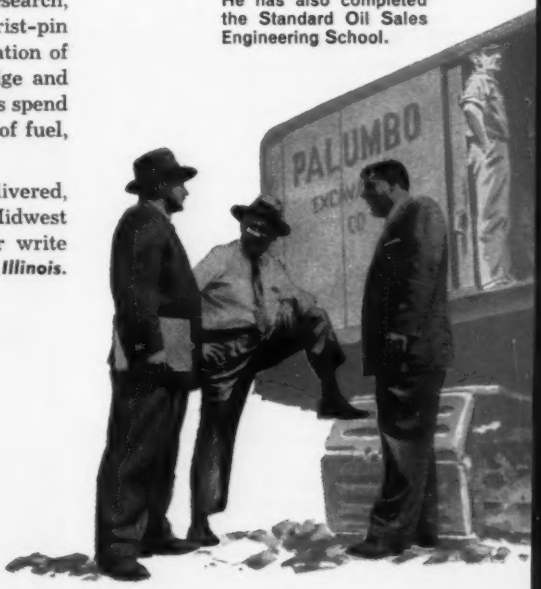
Peter A. Palumbo, general manager of the company and grandson of its founder, tells why: "Standard's products are superior. The service is 100 per cent . . . anywhere we have a job. We've never experienced delays from Standard Oil; I have confidence in the name Standard."

For instance, on the project pictured on this page, as on all its jobs, Palumbo has found that Standard provides the right combination to keep equipment constantly on the job: STANOLUBE HD-M Motor Oil and the technical know-how supplied by Standard Oil automotive lubrication specialists.

STANOLUBE HD-M gives superior service under grueling conditions. It is refined from highest-quality base stock. As a result of Standard Oil research, STANOLUBE HD-M is formulated with an additive that prevents bronze wrist-pin bushing corrosion. Other additives retard oil oxidation, minimize formation of piston ring deposits, prevent formation of excessive varnish and sludge and prevent corrosive attack on bearing metals. Standard's trained specialists spend hours on the job site to make sure equipment is never down for lack of fuel, lubrication or service.

This dependable combination—highest-quality products, promptly delivered, and skilled technical service—can be yours, too, anywhere in the 15 Midwest or Rocky Mountain states. Call your nearest Standard Oil office. Or write ***Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.***

Putting Expressways Together. Excavating for interchange joining three major Chicago-area expressways, the Palumbo Company is moving 472,000 cubic yards of earth. Here are Peter A. Palumbo, John L. Bugatto of Standard Oil and Charles Bohac, general superintendent for Palumbo. John prepared for the technical advice he gives on jobs like this by obtaining an engineering degree at the University of Illinois. He has also completed the Standard Oil Sales Engineering School.



Quick facts about

STANOLUBE HD-M Motor Oil

- Refined from highest-quality, solvent-extracted base stocks.
- Contains special additives that prevent bearing and bronze wrist-pin bushing corrosion, reduce piston varnish and keep rings free to seal against blow-by.
- Contains still other additives that reduce wear on heavily stressed parts.

YOU EXPECT MORE FROM STANDARD AND GET IT!

Motor-minded Palumbos: Fourth generation. Joey and Sam, Peter Palumbo's sons, riding in their motor-driven car, hand-built by their dad. In background is one of the company's heavy-duty trucks used at the expressway project. Standard Oil fuels and lubricants keep the Palumbo equipment dependably on the go.

EQUIPMENT PLANNING MAKES JOBS GO FAST . . .
continued from page 171

Concrete Mats 5 Ft Thick Cap the Piles

To get the speed, Raymond drives piles on a two-shift-a-day basis. The huge trestle-riding driving rig with a 70-ft jib drives piles the entire width of the building from one working position.

Raymond put the rig together from components. They brought it to the job disassembled, lowered it piece by piece into the 40-ft-deep excavation, and there reassembled it on the trestle.

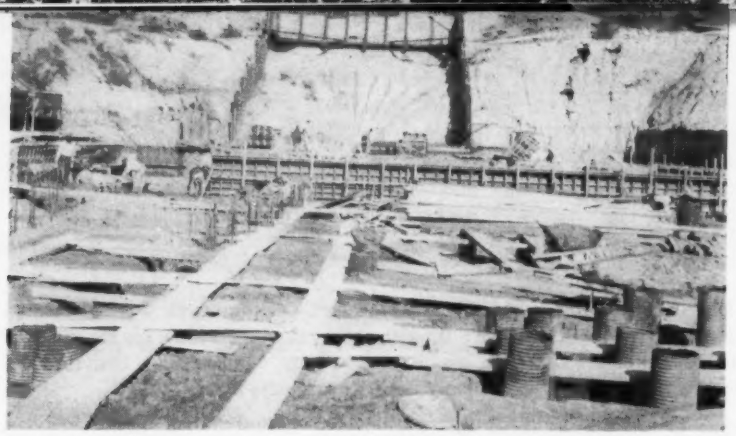
This trestle consists of a series of parallel 12x12-in. timbers spaced 6 ft apart down the length of the site. They serve as ties for two pairs of 14 WF beams placed about 20 ft apart to act as tracks over which the big rig rides on oak rollers.

Each pile shell is fabricated on the job. Small sections are welded together to make a full-length pile shell. A steel driving boot finally is welded to the bottom of the shell and the shell then is rolled down the embankment to the driver.

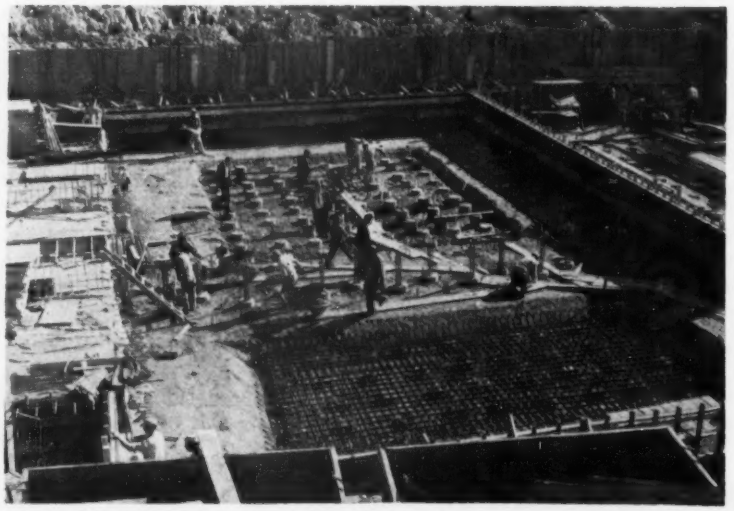
A Vulcan 13,700-psi hammer with a 39-in. stroke drives the shell to its required 50-ton load. The driver works from one end of the site to the other. A block and fall pulls it along when repositioning is needed. The 70-ft jib reaches out far enough on either side of the rig to drive piles the full width of the building.

Each shell then is steam cleaned, inspected, and, if properly driven, filled with 3,750-psi concrete. As the rig completes a section of piles Gunnell's forces cap the piles with 5-ft-thick concrete mats.

S. T. Irelan and S. W. Schaffer are Raymond's superintendents on the job. Gunnell's superintendent is Charles Lawrence.



BUILDING FORMS—While pile driver works ahead, workmen quickly throw up forms around a cluster of concreted piles to ready pour of 5-ft-thick concrete pile cap and mat.



PLACING REINFORCING—Once form erection is well under way, workmen fabricate steel reinforcing mats over pile clusters and set up wood ramps for buggying concrete.

READYING POUR—Carpenters set water stop on form face before pour of first lift. Transit-mix trucks chute concrete to dual-gated Gar-Bro hoppers that feed buggies.

NEW!

ALSO FLAT-BED MODEL

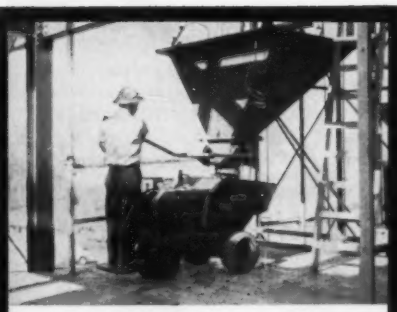
Whiteman WALK-OR-RIDE POWER BUGGY®

Compact, lightweight, extremely maneuverable, the new Whiteman "Walk-or-Ride" Power Buggy® is the perfect answer to placing concrete under many conditions. Travels over lighter, narrow runways, onto elevators, through 31" doors. Turns on a dime, has forward and reverse drive. Pours easily, neatly, accurately with perfected positive-control dumping mechanism.

Operator can either walk behind or ride on fold-down platform. Regulations do not require skilled labor to operate. All the time-tested stamina and rugged performance of the famous Whiteman DB-60 Power Buggy® have been built into this sturdy new Walk-or-Ride model. Ask your Whiteman dealer for full details or write for catalog today.

- Compact, lightweight
- Extremely maneuverable
- Rides on elevators
- Passes through 31" doors (With single wheels)
- Positive-control dumping mechanism
- Operator walks or rides
- 10 cu. ft. capacity
- Travels up to 5 mph
- Low center of gravity
- Reliable Wisconsin engine (Parts available everywhere)
- Hood-wheel chain drive
- Automatic clutch
- Forward and reverse drive
- Precision built. Rugged.

Does the work of FOUR hand buggies



"Walk-or-Ride" Power Buggy loads from hopper on upper floor.

Pouring is neat and accurate with positive-control dumping mechanism.

Whiteman

THE LEADER IN CONCRETE EQUIPMENT

WHITEMAN MANUFACTURING CO. **Dept. C**
13020 Pierce St., Pacoima, California

Please send prices, catalogs and name of distributor for:

- ☐ Walk-or-Ride Power Buggy
- ☐ DB-60 Power Buggy
- ☐ Screeding Machines
- ☐ Vibrators
- ☐ Floating-Finishing Machines
- ☐ Truck Mixers

Name _____

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Dig Faster...

Dump Cleaner...

Last Longer

INCREASE YARDAGE

Any way you look at it – from any angle – it's the taper that makes *ESCO* dragline buckets dig faster, dump cleaner, and last longer.

DIG FASTER. Bucket sides flare outward from the lip to increase loading speed. Materials are not compressed into the opening but allowed to expand and flow up and back along the tapered sizes filling the bucket completely without voids in the rear. Bucket fills in shorter drag distance, less line pull required.

DUMP CLEANER. Taper from front to rear and outward flare from lip to arch allows load to drop quickly and easily from the bucket. Load dumps clear of high tubular arch.

LAST LONGER. Tapered design reduces loading and dumping friction to an absolute minimum. Bucket lasts longer. All welded construction and the maximum use of alloy steel castings makes a high strength-to-weight ratio resulting in "lower cost per yard operation".

Bring your bucket problems to ESCO, your bucket specialists. ESCO will "job-tailor" a bucket to your operation. Ask your nearest ESCO dealer for complete details, or write direct.

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IN CANADA ESCO LIMITED

BELLING—Workman at bottom of caisson hole jackhammers out a bell through flaky bedrock surface. Belling provides insurance against possible faulting of the rock.

REINFORCING—Spiral reinforcing cage goes in at top of caisson hole while transit-mix truck backs up to hole. Spiral reinforcing also is used for building's columns.

CONCRETING—Concrete for most of the job is chuted directly into the hole. For some hard-to-reach caissons, the contractor puts buggies and buggy ramps to work.

EQUIPMENT PLANNING MAKES JOBS GO FAST . . .

continued from page 174

Caissons Go in At Rate of Six a Day

An equipment team of three Caldweld earth-boring rigs figures to save up to three months' time on the rambling 300x827-ft, L-shaped State Department Building.

With two caisson-boring rigs mounted on trucks and a third on crawlers, Eisenhart Foundations can drill the caissons while excavation is still under way.

To dig the caissons economically while earthmoving equipment continued the excavation, Eisenhart decided to rig up two types of borers. He mounted two Caldweld borers on truck chassis to move with speed over flat areas. He mounted a third borer on crawlers to cross trenches, move up grades, and handle hard-to-reach spots.

In operation the combination works fine. With it Eisenhart places an average of six completed caissons a day. Actual boring is fast, easy, and requires little manpower. A caisson team consists of an operator and oiler on each rig plus two laborers.

On a typical 5-ft-dia caisson, the borer cuts through varied overburden at a rate of 35 ft per hr at a diameter 1 ft less than finished diameter until boring hits bedrock.

Once rock is reached, a reamer replaces the boring bit and trims off the extra foot, bringing the hole to its finished diameter. The borer and reamer muck as they drill, dumping waste alongside the hole where a John Deere MC-20 front end loader fitted with a ½-yd bucket loads the material into a dump truck.

The boring rig then lifts a steel casing into the hole. A man goes down to jackhammer a bell into the bedrock, the hole is filled with 3,000-psi concrete, and the casing is pulled.

Myles Eisenhart, president of the foundation firm, personally supervises the work. General contractor on the job is John McShain, Inc., of Washington, D.C., with Paul C. Books as superintendent.

Pouring concrete for reinforced second floor slab for Houston Hospital and Dyer's Clinic, Houston, Mississippi.

ARCHITECT:
Ellerbe & Company
St. Paul, Minn.

ASSOC. ARCHITECT:
William I. Rosamond
Columbus, Miss.

CONTRACTOR:
G & K Construction Co., Inc.
Pascagoula, Miss.

DEALER:
Dendy Lumber Company
Houston, Miss.

Lehigh Mortar Cement contributed to good-looking exterior masonry in this new three-story, 65-bed Mississippi hospital.

Mississippi Contractor meets tight schedule with . . .

LEHIGH EARLY STRENGTH CEMENT

To meet the completion date requirement of their contract, the G & K Construction Company, Inc., set up a tight working schedule for this job at Houston, Mississippi.

By using Lehigh Early Strength Cement in the columns, floors and roof, they were able to keep within the time limit, yet avoid doubling form costs.

As a result, they saved $5500 on form and general overhead costs, and 35 to 40 days construction time.

That's why we say "Somewhere on nearly every job, Lehigh Early Strength Cement will save you time and money."

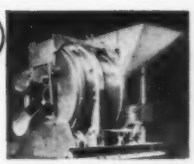
- LEHIGH PORTLAND CEMENT
- LEHIGH EARLY STRENGTH CEMENT
- LEHIGH MORTAR CEMENT
- LEHIGH AIR-ENTRAINING CEMENT

LEHIGH PORTLAND CEMENT CO.
ALLENTOWN, PA.

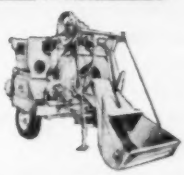
LEADING THE PARADE

with a line of proven performers that make you bigger profits

Rely on rugged, dependable CMC equipment to keep you a step ahead with day-in, day-out cost-saving performance.

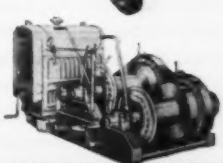


CENTRAL PLANT MIXERS . . . designed to speed up production on big jobs and in commercial ready mix plants. Three sizes . . . 1, 2, and 3 yard capacities.



BUILDING MIXERS . . . rugged, compact, easy to spot, easy to move. Make you more money on every job. From 3½S to 16S sizes.

DUAL PRIME PUMPS . . . automatic priming, self-cleaning. Capacities from 4000 to 240,000 g.p.h. Gasoline, diesel or electric. ALSO DIAPHRAGMS, OTHER TYPES.



HOISTS . . . tops in design, construction, efficiency. Many sizes. Complete selection in single and multiple drum models from 8 to 45 H.P.

TRANSCRETES . . . with real money-making, cost-saving features including SWING-OUT HOPPER, trouble-free FLOATING DRIVE. Truck Engine Drive, Separate Engine models. 4 to 7 yds. mixing capacities.

PLASTER & MORTAR MIXERS . . . exclusive CMC "Triple-Hoe" mixing action for better quality, quicker mixes. 4 to 12 cu. ft. sizes.

FREE LITERATURE

Gentlemen: Rush me your latest literature on CMC products I have checked below —

- ☐ TRANSCRETES
- ☐ PLASTER & MORTAR MIXERS
- ☐ CENTRAL PLANT MIXERS
- ☐ BUILDING MIXERS
- ☐ PUMPS
- ☐ HOISTS

NAME _____

ADDRESS _____

CITY _____ STATE _____

CONSTRUCTION MACHINERY CO., WATERLOO, IOWA

The Year Advertising Helped

This editorial message was first published by McGraw-Hill two years ago. It describes advertising's dramatic contribution to the American economy during 1954. The theme of the editorial—that advertising can help promote economic stability by stimulating sales at a crucial time—is even more pertinent today.

As our economy grows, it is constantly changing. The conditions business faces today are not the same in every respect as those it faced in 1954. But business again has the opportunity, through advertising and other selling efforts, to help sustain a high level of economic activity. At the same time, it will be building markets for the period of renewed expansion that is sure to follow.

This editorial is reprinted exactly as it appeared in 1956 except for minor editorial changes to bring it up to date. Permission is freely extended to newspapers, groups or individuals to quote or reprint all or parts of the text.

Donald C. McGraw

PRESIDENT

McGraw-Hill Publishing Company, Inc.

IN 1954 we had a business recession in the United States. Sales fell about 4% during the year. If management had followed the historic pattern of business ups and downs, advertising volume would have fallen much further.

But in 1954 the volume of advertising did not fall. It increased over 5%, and expenditures in all major advertising media rose. Every effort was made to stimulate sales when sales were needed to sustain prosperity.

This was something entirely new under the sun. It had a powerful influence in making the recession of 1953-54 one of the mildest on record. It helped greatly to speed business on to the record-breaking levels it attained in the years 1955-57.

There are several reasons why America's business management attacked this decline in sales with more advertising. One of them grew out of the greatly strengthened position of the American consuming market. Consumers' income after taxes has been rising an average of over $10 billion a year since 1946, and this rising income is more widely distributed than ever before. Furthermore, consumers had piled up reserves of about $200 billion in cash or its equivalent. These reserves offered a new and powerful inducement to increased selling and advertising effort even in the face of a possible decline in consumer income. (At the end of 1957, consumer reserves were $225 billion.)

Taking the Longer View

However, the principal reason why a sales decline was attacked with increased advertising is management's new-found conviction that good advertising is essentially an investment in the development of a market. Successful development requires sustained investment. The inclination of business management to take this longer view is, of course, motivated

McGraw-Hill PUBLISHING COMPANY,

ABP HEADQUARTERS FOR

Kill a Business Recession

by the fact that the American market, with over 3 million consumers being added annually, is growing at a prodigious rate.

Ten years ago only a handful of companies had plans for investment in new producing facilities extending beyond the current year. Today almost all leading companies have investment programs running some years ahead. And keeping pace with these long-range investment plans has been the development of sales and advertising programs to reach tomorrow's greatly expanded markets.

Advertising's Key Role

This crucial role of advertising in providing driving power for our economy is gaining greater recognition every day. In his book, "People of Plenty," Professor David M. Potter of Yale University remarked: "Advertising is not badly needed in an economy of scarcity, because total demand is usually equal to or in excess of total supply, and every producer can normally sell as much as he produces. It is when potential supply outstrips demand—that is, when abundance prevails—that advertising begins to fulfill a really essential economic function."

Today abundance so completely prevails in the United States that it has been conservatively estimated that as much as a third of everything offered for sale falls in the realm of "optional consumption." That is, consumers can "take it or leave it" without any immediate personal inconvenience. But if they decide to "leave it," a terrific economic depression will not be far behind. In such circumstances, advertising—in which, in all of its forms, we are now investing over $10 billion annually—clearly is of crucial importance to our continued prosperity.

In performing its key role in past years, American advertising never realized its full potential. It successfully promoted sales. But it never was called upon to promote an overall economic stability as a direct outgrowth of increased sales.

By successfully promoting both sales and economic stability, as it did in 1954, advertising surely has added new strength to the American economy. It has also added a great new and constructive dimension to advertising itself.

One of the surest means of expanding your sales volume in today's industrial markets is through dominant advertising in the publications directly serving your major customers and prospects.

McGraw-Hill's business and technical publications can give you quick access to the men who initiate, specify and approve the purchases of industrial products and services. Because all are leaders in their respective fields, you are assured a maximum return on your advertising investment when you *concentrate* in the McGraw-Hill publications serving your most important markets.

INCORPORATED · 330 West 42nd St., New York 36, N. Y.

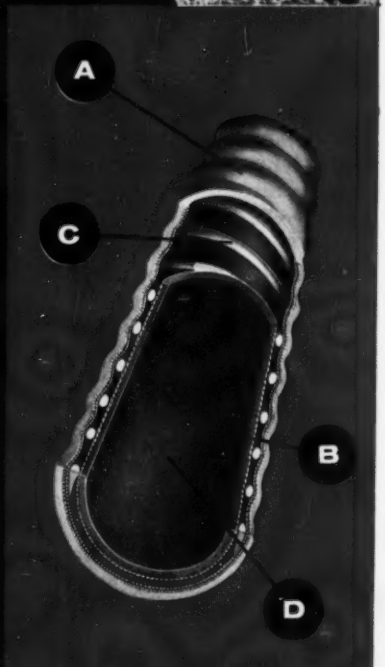
B U S I N E S S I N F O R M A T I O N

Ten tons can't crush Acme-Hamilton cord suction hose

Acme-Hamilton's cord suction hose recovered its shape, and continued its suction operation even after it was run over by a ten-ton tractor rig not just once, but five times. This same hose was then subjected to a laboratory mercury vacuum test in excess of its recommended pressure without collapsing.

Check these features:
(A) Abrasion resistant red cover
(B) Cotton duck plies
(C) Rubber bonded plastic cord in 2½" and 3" sizes
(D) Smooth bore tube

Specify Acme-Hamilton cord suction hose when you order from your distributor, or write to Acme-Hamilton, Dept. HS-4.



Acme Hamilton

MANUFACTURING CORPORATION, TRENTON 3, N. J.

Divisions: Acme Rubber Mfg. Co. • Hamilton Rubber Mfg. Corp.

ATLANTA • BOSTON • CHICAGO • DETROIT • HOUSTON • INDIANAPOLIS • LOS ANGELES
MILWAUKEE • NEW YORK • PITTSBURGH • SALT LAKE CITY • SAN FRANCISCO • SEATTLE

Construction Men in the News...

ARBA chief...

JULIEN R. STEELMAN,, president of The Koehring Co., Milwaukee, Wisc., will serve a second term as president of the American Road Builders Association. He was reelected during ARBA's 56th Annual Convention in Washington, D.C. RUDOLPH KRAEMER, of Edward Kraemer & Sons, Plain, Wisc., will head ARBA's Contractor Division for 1958.

Steelman had succeeded John N. Robertson as ARBA president in 1957.

Kaiser Engineers

GEORGE HAVAS and L. H. OPPENHEIM each will head one of the two newly formed operating divisions of Kaiser Engineers Division of the Henry J. Kaiser Co.

The company divided the construction division into two interrelated but independent operating groups to meet demands of growing business. They will be known as the Heavy Construction Division, which will handle all overseas work and heavy construction projects throughout the world, and the Kaiser Engineers

Division, which will handle all industrial engineering and construction in the United States and Canada.

Havas will head the Heavy Construction Division as vice president and general manager. Oppenheim will hold the same titles in the Engineers Division.

Other executives named as a result of the reorganization are John Hallett, assistant general manager of Havas' division, and J. E. Hughes, assistant general manager to Oppenheim.

Raymond Concrete Pile

BRIG. GEN. B. B. TALLEY, U.S. Army (ret.), GERALD O'CONNOR, and EDWIN T. MORRIS are new vice presidents of Raymond Concrete Pile Co. The positions were newly created as part of a general expansion of the firm's overseas program.

Talley joined the company in 1956. He has been in charge of construction of Brasilia, the new capital of Brazil, and President of Raymond's Brazilian subsidi-

ary. Before joining Raymond, Talley was Division Engineer, Mediterranean Division, Corps of Engineers, heading construction of Air Force bases in North Africa and the Middle East.

O'Connor joined Raymond in 1929. He has supervised many major projects in the Venezuelan area including the Creole Petroleum Co. offshore storage and loading station in Lake Maracaibo. O'Connor opened Raymond's office in Caracas in 1936 and was chief executive officer of a number of the company's Venezuelan subsidiaries.

Morris, since joining Raymond as a field engineer in 1937, supervised construction of the Great Lakes Steel Ore Dock at Zug Island, Mich., the San Juan Steam Electric Plant in Puerto Rico, and the Free Port of Monrovia in Liberia.

continued on next page

Hunkin-Conkey

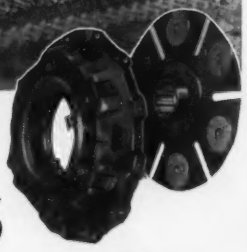
PAUL R. SMITH is a new vice president of The Hunkin-Conkey Construction Co., Cleveland, O. Chief engineer of the company's heavy construction division since 1955, Smith has worked on such projects as Republic Steel Corp.'s huge Cleveland expansion program, Dyberry Dam in Pennsylvania, and steel plants in Youngstown and Chicago. In 1951 he was assistant project manager for construction of a taconite mining project in Minnesota.

Dravo

THOMAS M. BERRY is the newly appointed general superintendent for the Shaft and Tunnel Department of Dravo Corp., Pittsburgh, Pa., contractors.

One of Berry's first jobs will be supervision of all construction on the 10 mi of tunnel Dravo is building for the Allegheny County Sanitary Authority's new sewage project in the Pittsburgh area. Before joining Dravo in 1948, Berry was staff engineer for the Iron and Steel Institute.

ROCKFORD



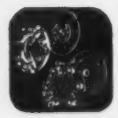
MORLIFE® CLUTCHES

Keep Heavy-Duty Machines 400% More Hours ON the Job 90% Less Time IN the Shop

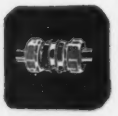
MORLIFE clutches serve from four to ten times longer than previous types of friction clutches using organic facing materials. *Adjustments and plate replacements have been reduced to one-tenth those required by previous clutches.* The longer on-the-job hours and increased pay loads which MORLIFE clutches make possible furnish a competitive advantage for machines in which these NEW clutches are used. Increased clutch life results in decreased operation cost of vehicles or equipment.

SEND FOR THIS HANDY BULLETIN
Gives dimensions, capacity tables and complete specifications. Suggests typical applications.

ROCKFORD Clutch Division BORG-WARNER
1331 Eighteenth Ave., Rockford, Ill., U.S.A.
Export Sales Borg-Warner International — 36 So. Wabash, Chicago 3, Ill.


Small Spring Loaded

Heavy Duty Spring Loaded


Oil or Dry Multiple Disc

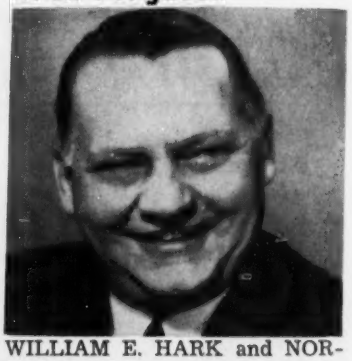
Heavy Duty Over Center

Power Take-Offs

Speed Reducers

CLUTCHES

H. K. Ferguson



WILLIAM E. HARK and NORVON CLARK are new vice presidents for the H. K. Ferguson Co., Cleveland, O., engineers and builders. Hark will be in charge of construction, and Clark will handle new business activities.

Hark joined the company 23 years ago as a field engineer. He later became construction superintendent, central district construction manager, and, in 1956, general construction manager. Before joining Ferguson, he spent 13 years in construction of many government, industrial, and private jobs.

Clark formerly was eastern district manager with offices in New York. Paul Erskine will succeed him as district manager.

J. H. Pomeroy

WALTER P. O'FARRELL is a new vice president of J. H. Pomeroy & Co., San Francisco contractors and engineers.

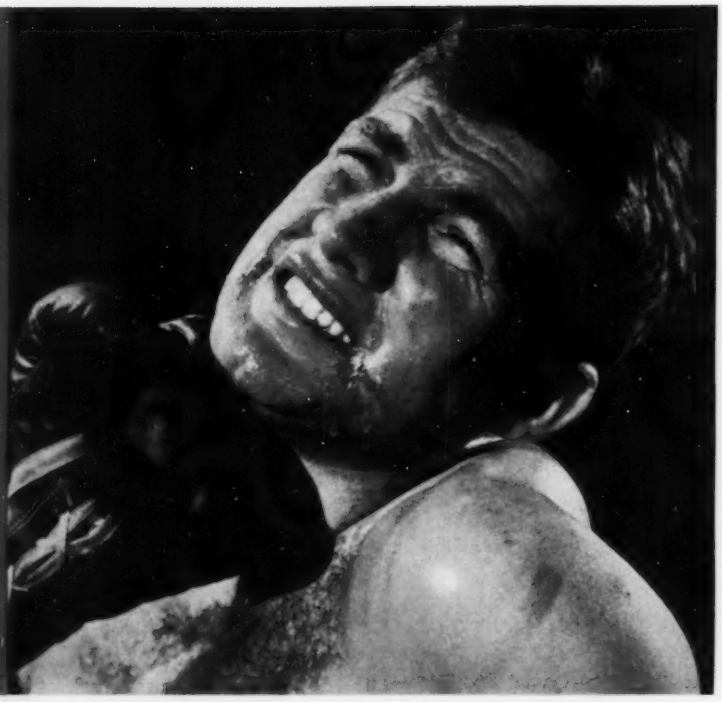
He joined the firm three years ago after 32 years service as chief estimator and construction manager of Clinton Construction Co. of San Francisco.

Austin

GEORGE A. BRYANT, president and former general manager of The Austin Co., is the new chairman and chief executive officer of the international engineering and construction firm.

Bryant joined Austin in 1913 as a field engineer. He became general sales manager in 1918.

When the going gets tough



Amoco Superior Diesel Oil S-1 has what it takes to handle severe engine operating conditions

Amoco Superior Diesel Oil S-1 (SAE 10 to SAE 50) is a special heavy duty motor oil developed to meet unusually severe engine operating conditions where unwanted, troublesome varnish, sludge, and carbonlike deposits form on engine parts.

This product provides effective lubrication for diesel engines operated under severe conditions even when using high sulphur fuels. It is also effective in controlling deposits in certain classes of particularly severe gasoline or other spark ignition engine operations. Recommended for API Service Designation DG-DM.

AMOCO®

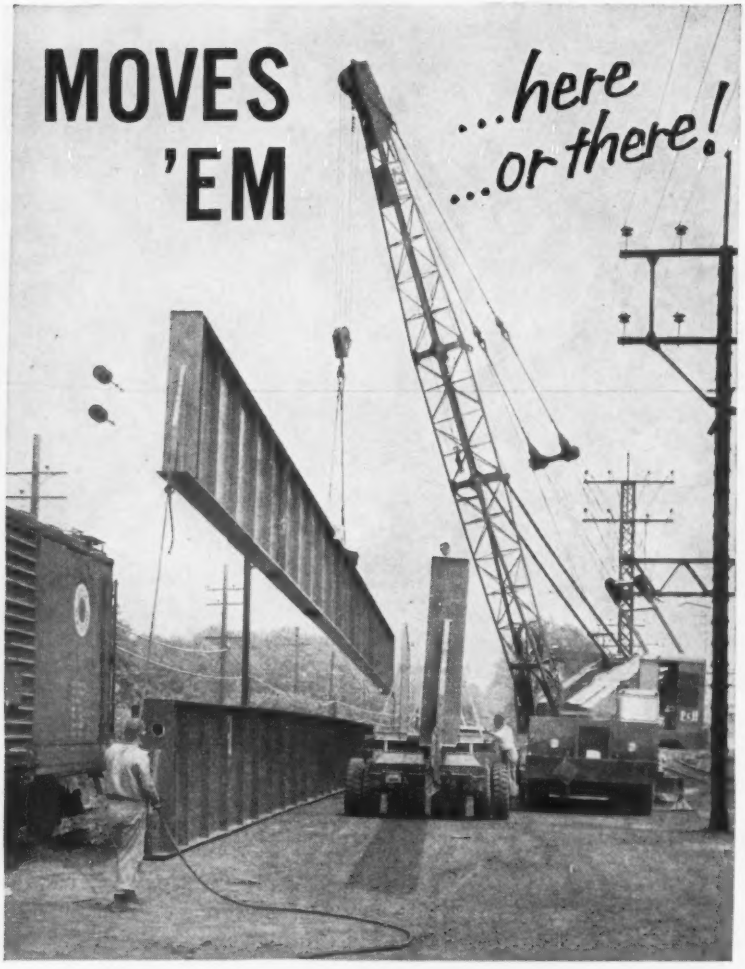
SUPERIOR DIESEL OIL S-1

When you want top performance, you want Amoco

American Oil Company, 555 Fifth Ave., New York, N. Y.

AMOCO ALSO PRESENTS . . .

- Amoco HDX Oil
- Amoco Superior Diesel Oils, S-2 or S-3
- Permalube Gear Oils
- Perma-Flo Oils
- Permalube All-Purpose Grease No. 158
- Vesuvius "X" Gear Compounds

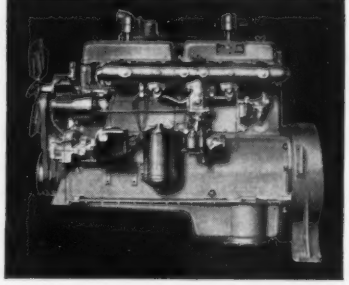


WAUKESHA Power

Loading steel beams—up to 102 ft. long, weighing almost 15 tons each—for transport from the railroad at Cos Cob, Conn., to the Nianus River viaduct site, a part of the Connecticut Thruway project. It's a P & H crane, with 55 ft. boom—Waukesha powered with a 140-GK engine—owned and operated by the Klevens Corporation of Yonkers, New York.

POWERING P & H CRANE

Waukesha 140-GK Gasoline—6-cyl., 4½ x 5½-in., 525 cu. in., 155 hp @ 2250 rpm. Send for descriptive bulletin 1548.



368

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN

NEW YORK TULSA LOS ANGELES

Sales and Service

Equipment purchasing and servicing takes less time when you know who and where to call. Keep advised of new distributors, sales personnel and other activities.

Distributor Appointments

Clark Equipment Co.: The Construction Machinery Division has appointed Aring Equipment Co., Inc., of Milwaukee, Wis., as distributor for Wisconson.

Yale & Towne Mfg. Co.: The following six distributors for Trojan tractor shovels have been appointed: The Texas Machinery & Equipment Co. of Amarillo, Tex.; The Pecaut Equipment Co. of Sioux Falls, S. D.; The Swaney Oil & Equipment Co. of Fort Dodge, Ia.; The Normont Equipment Co. of Great Falls, Mont.; The Contractors' Equipment & Supply Co. of Albuquerque, N. Mex.; The Edward R. Bacon Co., Ltd., of Honolulu, Hawaii.

Baldwin-Lima-Hamilton Corp.: Precision Machine and Equipment Ltd. of Calgary and Edmonton, Alta., Canada, has been appointed distributor for the province of Alberta.

Four Wheel Drive Auto Co.: The following six transport and ready-mix concrete truck dealers have been appointed: Texas Industrial Equipment Co. of Kyle, Tex.; Maier-Schule GMC Inc. of Buffalo, N. Y.; Pan Am Services, Inc. of Houston, Tex.; Weust Motors, Inc. of Terre Haute, Ind.; Frank D. Stewart Tire Co. of El Paso, Tex.; and Gilly's Motor Co. of Farmington, N. Mex.

LeTourneau - Westinghouse Co.: Construction Service Equipment Co. of Omaha, Neb., a wholly owned subsidiary of Paxton-Mitchell Co., has been appointed LeT-Wesco distributor for the state of Nebraska and three Iowa counties.

continued on page 191

BEST GREEN CONCRETE BLADE YET!

In a recent test cutting 3 day concrete, one Felker DI-LOCK diamond blade cut a total of 8,000 feet 1" deep against 3,500 to 5,000 feet for competitive blades cutting to the same depth! Aggregate was gravel, flint and quartz. Blades were all operated on the same 36 h.p. concrete cutter and on the same job.

THIS IS ANOTHER TYPICAL CASE HISTORY OF DI-LOCK SUCCESS—

Reports keep pouring in from all over the nation with the same impressive facts... *more footage, faster cutting, greater economy per blade!* If you want lower cost per cut there's one *sure* answer proved by contractors from coast to coast! Specify Felker DI-LOCK'S, America's *longest-lived* diamond blade!

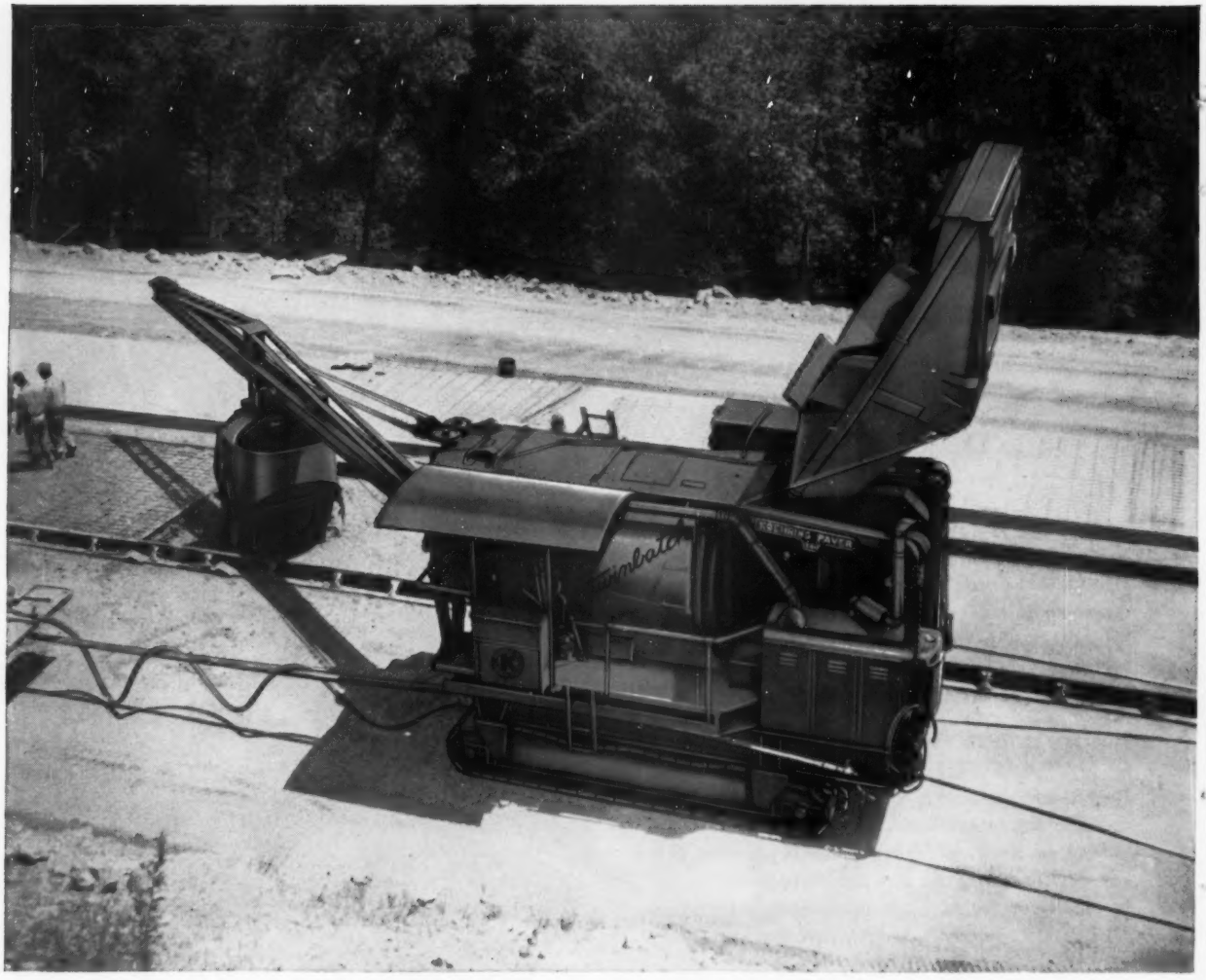
See your Felker Distributor or write for information.

Full line of Felker Concrete Cutting Machines! Illustrated: Felker Model 367-36 h.p.

First in Diamond Cut-Off Blades!

FELKER DI-MET SINCE 1924

FELKER MANUFACTURING CO.
Torrance, California



Pouring concrete in strips 12 feet wide on a new expressway, Koehring 34-E *twinbatch* paver averaged 1100 feet per 8-hour day. 10-inch slab consisted of 8-inch mesh-reinforced base, 2-inch top course.

PLAN YOUR SPREAD FOR

the heavy paving program ahead

Long-range outlook on the extensive road program, and new "jet-age" airbases, indicates a steadily-rising curve of construction activity in all areas. It also indicates plenty of paving business ahead for the contractor who is in a position to compete favorably in the bidding, and who can profitably complete contracts *on schedule.*

In planning your equipment spread, you can't afford to gamble on the production end of your job — *at the paver,* where every second counts. That's where the *reserve* production capacity of a Koehring 34-E *twinbatch*® protects your schedules and profits. It hits a top output of 86.7 batches an hour, on 60-second mixing cycle. This lets you pick up any lost time, when you need it, to offset normal job and material delays — maintain a high *average* speed throughout duration of the job — keep batch plant, trucks and finishers working at peak efficiency. With *twinbatch* Autocycle control, every mixing operation is automatic, accurate, and fast. Drum charging, mixing, transfer and discharge are all synchronized by Koehring Batchmeter, a simple timing device. 8-second skip-hoist speeds charging. Big, double-door bucket and wide-swinging boom speed concrete distribution on the grade. What's more, accessibility of every paver maintenance point, plus heavy-duty construction, all help to keep paving jobs rolling *on schedule.*

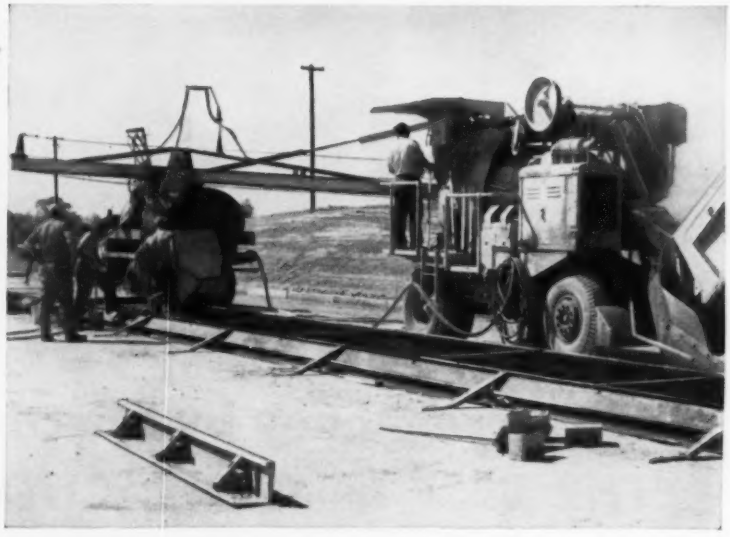
You'll find there's no substitute for the steady output, speed and economy you can get with 34-E *twinbatch* pavers on your big-production highway and airport contracts. Talk it over with your Koehring distributor. He has more information that will interest you. Why not call him *today?*

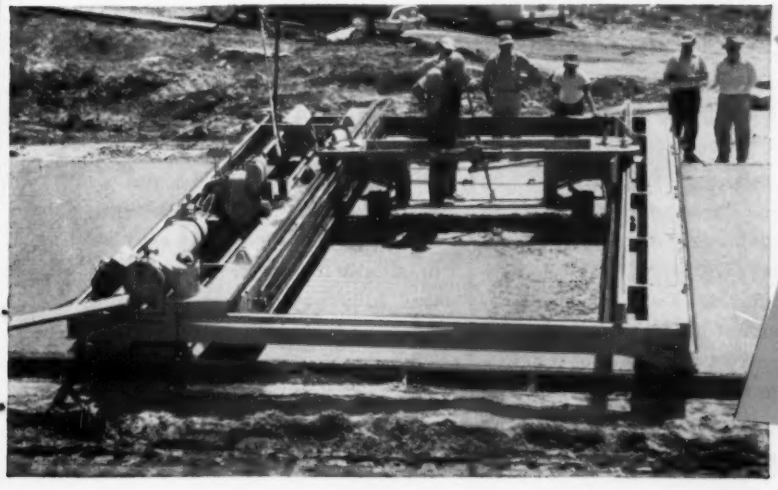
34-E *twinbatch* team works side-by-side on big U. S. airbase

Widening runways on a military airstrip, contractor completed job "on the double" with a pair of big Koehring 34-E *twinbatch* pavers. Notice how one long-boom 34-E poured the outside half, while the other poured the inside half of the strip. For balanced, high rate of production at *both ends* of the job, many contractors team up *twinbatch* pavers with C. S. Johnson automatic batch plants (another Koehring product worth checking). Clamshell cranes, finishers also available in big Koehring paving "package".

Mobile 16-E paves center-strips, intersections, bridge-approaches

On street and highway jobs, there's always extra concrete to be laid in addition to the main slab, such as curbs, gutters, center-strips, scattered intersections, approaches to driveways, bridges and side-roads. Consider the time-saving flexibility you can get with a rubber-tired *twinbatch* in your paving spread. This Koehring 16-E is as mobile as your batch trucks — can get back on the new slab *in as little as 7 days* to do clean-up work, or pave adjoining strips. Also has high elevated discharge, pours into overhead hoppers, forms, chutes. You'll find its usefulness unlimited as a utility unit . . . or as a general-purpose paver.





"Timely" precision-finishing —

is important on every paving job. Operating at almost twice the speed of a 34-E paver, Koehring Longitudinal Finisher handles all practical consistencies of concrete — harsh, wet or dry — produces smooth, mechanically-accurate slab with uniform crown transitions.

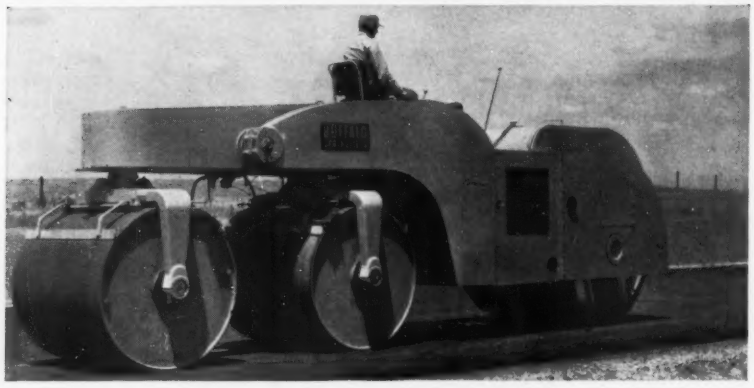
KOEHRING

DIVISION OF KOEHRING COMPANY

Milwaukee 16, Wisconsin

EXCAVATORS • CRANES • PAVERS • FINISHERS • DUMPTORS® • MUD-JACKS®

K753REV.



Make *more* money by selecting *THE BEST IN COMPACTION EQUIPMENT...*

For base fill compaction, the Buffalo-Springfield* self-propelled K-45 Kompactor** roller has proved a real money-maker. It operates on the "Interrupted Pressure Principle." All compaction is directed downward. Contractors testify the K-45 meets density requirements in one-fourth the time normally required.

*TRADEMARK REG. U. S. PAT. OFF. **TRADEMARK

BUFFALO-SPRINGFIELD
Roller Division-Koehring Company
SPRINGFIELD, OHIO

For super surface finishing and fine grade compaction, the famous 3-axle tandem roller with exclusive "Walking Beam" compaction control is the answer to those big jobs—super highways, airfield runways, and wherever specifications are extra strict.

For sub-grade compaction of the large variety of materials, found in fills, sub-grades, and unfinished bituminous pavements, Buffalo-Springfield offers two 3-wheel rollers ranging from 10 to 15 tons. Ballastable rolls provide wide range of compressions to meet every requirement.

For general asphalt finishing and maintenance, Buffalo-Springfield's two-axle tandems, ranging from 5 to 16 tons, are unequaled for heavy-duty highway and public works projects. There is a right size for every job!

For those smaller jobs, driveways, sidewalks, parking and playground areas, or for patching and light finish work, use the KT-7A, 3-5 ton, or KT-8, 4-6 ton portable tandem rollers. The KT-8 is equipped with hydraulically retractable towing wheels that "fold-away" into the main frame when not in use.

For complete information on all Buffalo-Springfield Rollers and K-45 Kompactor roller, see your nearest Buffalo-Springfield Distributor.

SALES & SERVICE...

continued from page 186

On the Sales Front

Harnischfeger Corp.: The Construction and Mining Division announced the following promotions: C. R. Morgan, Jr., sales manager soil stabilizers and Sierra loaders; F. J. Hirner, sales manager electric excavators; G. T. Raubach, assistant sales manager electric shovels; W. N. Ryan, Chicago district manager; R. B. Maxson, Buffalo district manager.

Pettibone Mulliken Corp.: Alex E. Ainley has been named Western regional manager with headquarters in San Francisco. Clem C. Persily becomes Midwest regional manager and will operate from Chicago. Len Wichman in New York becomes Eastern regional manager, and John J. Newsome, Jr. is New York area branch manager.

R. G. LeTourneau, Inc.: Robert A. Bever has been appointed export sales representative for the company. Bever has had extensive experience as a heavy equipment salesman in Europe and the Middle East.

Olin Mathieson Chemical Corp.: Eight new district sales managers have been appointed for Ramset Fastening System. They are: D. W. Champlin, lower New Jersey and eastern Pennsylvania; R. H. Ernst, southern California; E. P. Gavin, Alabama, Arkansas, Louisiana and western Tennessee; A. G. More, Virginia, Maryland, Delaware, and Washington, D. C.; F. A. Mullen, northern California; K. E. Van Scoy, Iowa, Kansas, Missouri, Nebraska and Oklahoma; R. E. Mullis, eastern Tennessee, North and South Carolina, and Georgia; S. F. Nicholas, New York, Connecticut and Rhode Island.

Columbus McKinnon Chain Corp.: The Chisholm - Moore Hoist Division has appointed these three sales representatives: Herbert Bays Moore in Virginia, North Carolina, South Carolina, and eastern Tennessee; Charles A. Schnell, Detroit area; and William J. Hildebrand, Cleveland area.

continued on next page

GET ANOTHER FULL ROUND OF SERVICE

FROM YOUR WORN OFF-THE-HIGHWAY TIRES

Selection of tread designs available for tires from 7.50 x 15 to 30 x 33 to fit variety of conditions and equipment.

TREADING truck and earthmover tires with the special Hawkinson Construction Tread is proving to be a considerable economy measure on many construction projects.

For approximately half the cost of a new tire, contractors repeatedly have obtained another full round of service out of a tire, and frequently a second and third if the casing hasn't been damaged beyond repair.

Before you buy new tires for any of your rubber mounted equipment, it will pay you to discuss your tire needs with one of the highly trained and thoroughly experienced Hawkinson Tread Operators located across the nation.

WRITE us for complete information on our widely accepted line of Hawkinson processed treads and the name and address of the nearest fully equipped Hawkinson operator.

PAUL E. HAWKINSON CO.
1325 WINTER ST. N.E.
MINNEAPOLIS 13 MINNESOTA

You just can't beat this HOBART "CONTRACTOR'S SPECIAL" for fast, more profitable WELDING!

Gas Drive Husky Boy

AC Welder/AC Power Weldmobile

New **HOBART** *"Rocket 24"* iron powder electrode! New and faster. Designed to keep pace with faster production and lower cost welding with excellent results. To be convinced, just try some.

When it comes to a welder that contractors can depend on to do a top job anywhere, any time, you can't beat a Hobart. Specially designed to meet the varying conditions and requirements of in-the-field welding. Compact, light weight, and with a hot fast arc and lots of engine power. A Hobart can save you hundreds of dollars on repairs and construction work. Send in the coupon and very quickly you'll get the complete story from us—no obligation. HOBART BROTHERS CO., BOX 638, TROY, OHIO. Ph. FEderal 2-1233. Manufacturers of the world's most complete line of arc welding equipment.

HOBART TROY OHIO **WELDERS**

HOBART BROTHERS CO., BOX 638, TROY, OHIO

Send information on:_____ampere capacity.

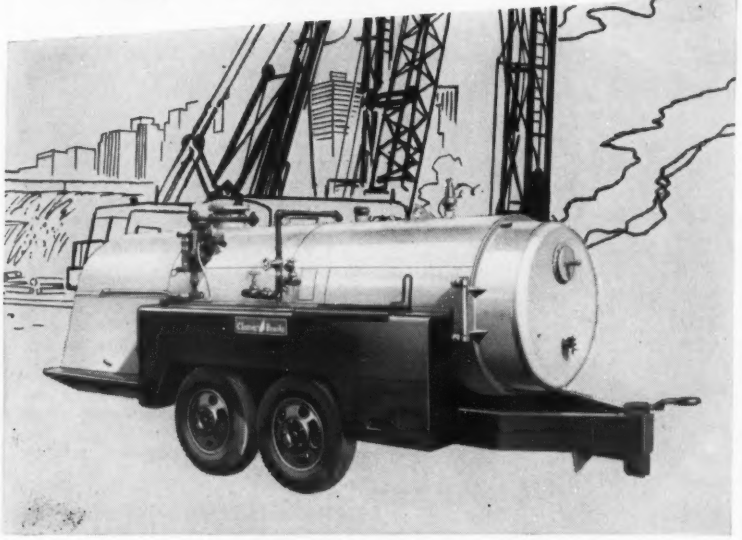
- ☐ Contractor's Special
- ☐ Husky Boy
- ☐ Gas Drive
- ☐ AC Welder/AC Power
- ☐ Weldmobile
- ☐ Electrode catalog
- ☐ Check here for your FREE Weldor's Vest Pocket Guide

Name_____

Firm_____

Address_____

FAST, DRY STEAM
wherever wheels can roll...



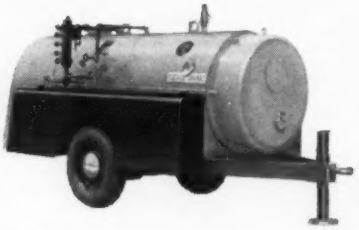
CLEAVER-BROOKS PORTABLE STEAMERS

125 HP 4300 lbs. of dry steam from a cold start in 30 minutes . . .

The PSM-125 maintains this pressure continuously . . . delivers steam on demand . . . in direct proportion to load. It puts more productive capacity into pile-driving hammers . . . has reserve capacity to match hammer sizes or heating requirements. Features one-control fire selector. All-weather protected. Fully fire-tested before delivery.

50 HP the huskiest multi-duty boiler in its range ever built

The PS-50 Cleaver-Brooks mobile steamer is the all-around machine you need . . . ideal for pile-driving, cleaning buildings, thawing culverts and dozens of other rugged jobs. You get quick steaming from a cold start . . . 1725 lbs. of dry steam per hour.



Cleaver-Brooks mobile steamers cost you less to run . . . get more work done . . . cost less to maintain. Famous four-pass, forced draft economy design produces high velocity gases that keep boiler flues clear of soot . . . minimize down time. Units are ASME code constructed . . . warranted to be free of defects in materials and workmanship. For complete details write:

Cleaver Brooks
COMPANY
Dept. C, 399 East Keefe Avenue, Milwaukee 12, Wisconsin
ROAD MACHINERY DIVISION

SALES & SERVICE...
continued

In the Main Office

Aluminum Company of America: The headquarters engineering department in Pittsburgh announces the following promotions: B. J. Fletcher, general manager of engineering; L. B. Kuhns, chief engineer; H. F. Robey, Jr., chief construction engineer.

Chrysler Corp.: Arthur S. Hudson has been named president of the Marine and Industrial Engine Division. Hudson joined the company in 1943.

Marion Power Shovel Co.: John A. Wettergreen has been named manufacturing vice president and general works manager. Wettergreen has been with the company for 21 years and has held a number of production positions.

Associations

Asphalt Institute: At the recent annual meeting D. Hugh Jenks, Jr., of the Ashland Oil & Refining Co. was elected chairman of the board. J. J. Tumpeer of the Witco Chemical Co. was named treasurer. The following three district engineers have been appointed: Cecil D. Miller, Oklahoma City, Okla.; Carl S. Larson, Portland, Ore.; Carl F. Lind, Los Angeles, Calif. Richard S. Titera becomes assistant district engineer at Los Angeles.

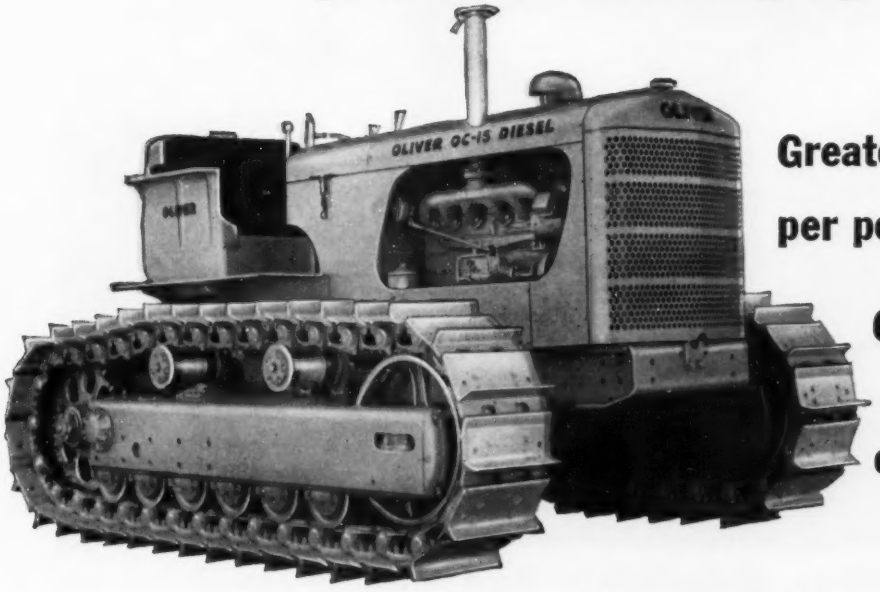
Clay Pipe Association: G. A. Robinson has been elected president of the association to succeed D. M. Strickland who retired this year. Albert J. Reed has been elected vice president. Reed will retain his post of director of research for the association.

Special Mention

National Safety Council: The Council is planning a second one-week training course for safety men during the week of May 19-23. The first course was held in February. The course "Safety Management Techniques" is designed for safety men of some experience, and graduates of the course in "Fundamentals of Industrial Safety." For further information write the Director of Industrial Training, National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

OLIVER

presents the mighty OC-15



Greatest horsepower per pound of tractor

Greatest return per dollar invested!

In nationally recognized official tests, the OC-15 came out first for power against every other tractor in its size class. It's the power leader *any way you rate it!* In total, the OC-15 is the most powerful, performance-packed, profit-making crawler for its size yet. It's 1958 modern...and ready for you right now!

- Greatest power to weight ratio...a full 110 net engine h.p. High-torque, 529-cubic-inch diesel.
- Has more reserve power—you work faster, more efficiently with any mounted attachment.
- Handles wider work range—all at less cost per yard-moved with its fuel-thrifty full diesel. 24-volt starting.
- Long 87⅛" crawlers with greater ground contact, higher flotation, tremendous traction! Six lower track wheels.
- Two-track turning action...easy air-steering operation.
- Heaviest-duty, service-saving design—reinforced and trussed at every stress point.
- Compare it on every count—price especially. You'll want the OC-15!

Oliver OC-156 Loader—gives a new speed and work range to your operations. Designed and factory-built as an integral tractor-loader, the big 2¼-yd. loader is matched to the full capabilities of the powerful tractor. Tremendous hydraulic bucket break-out action for toughest digging...high bucket lift for faster, more efficient loading. A lasting investment in lowest cost digging-loading-backfilling and other services.

OLIVER **THE OLIVER CORPORATION**

Industrial Sales Div., 19300 Euclid Ave., Cleveland 17, Ohio

a complete line of industrial wheel and crawler tractors and matched allied equipment

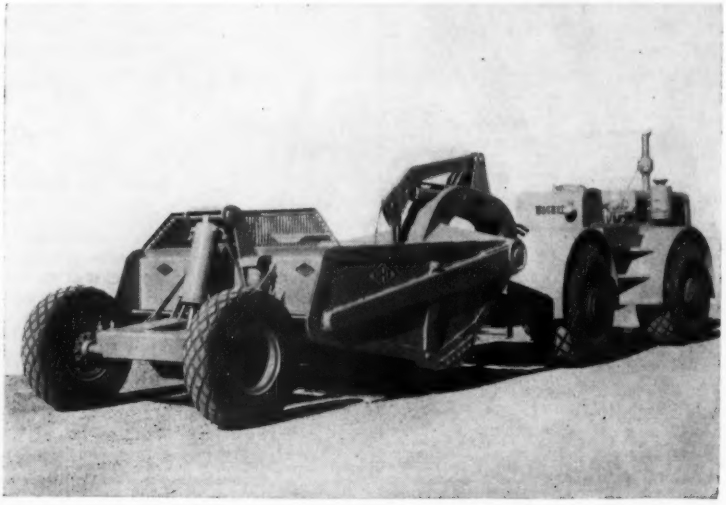
Construction Equipment News...

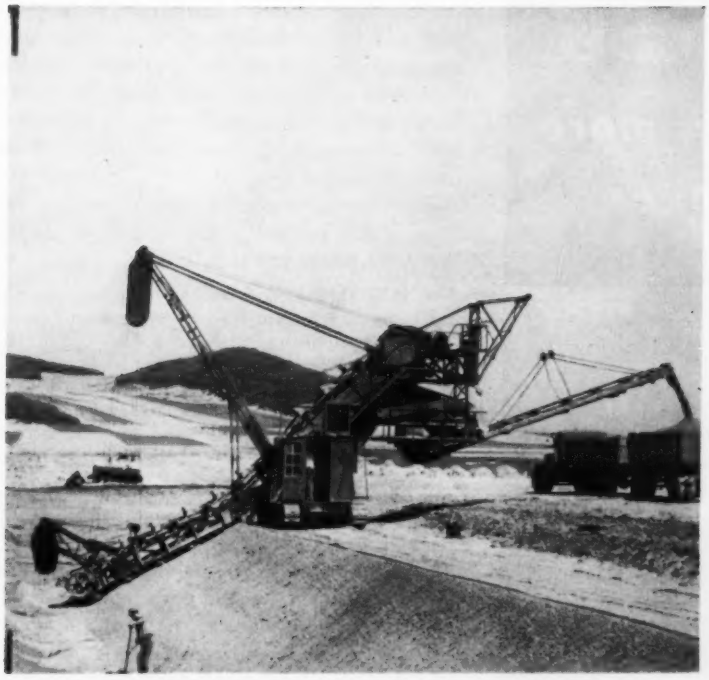
Clark Introduces 600-hp, 52-Ton Rubber-Tired Dozer

Clark has developed the most powerful production model tractor-dozer ever built—its new 600-hp, 104,000-lb Michigan 480. The giant tractor, which is nearly 27 ft long, 14 ft wide, and 11 2/3 ft high, is powered by a 12-cylinder Cummins turbocharged engine that provides a top speed of 28 mph, both forward and reverse. While it can handle tough dozing jobs with its 15-ft hydraulically-controlled blade, the 480 is designed for heavy-duty push loading. Tested on the Illinois Tollway, the big tractor loaded a 32-yd twin-engined scraper in 22 sec in sandy clay. In good working conditions, material packed into the scraper bowl at an average of 1 yd a sec, according to Clark field engineers. The model 480 features a four-speed, power-shifted transmission and a torque converter to make it easy to handle. Standard tires for the model 480 are 33.5-33, 26-ply — **Construction Machinery Div., Clark Equipment Co., Benton Harbor, Mich.**

New Scrapers For Wagner Tractors

Two hydraulically - controlled Ateco scrapers are now available for Wagner TR9 and TR14 rubber-tired tractors. Both feature a new hydraulic design that includes an air-cushion accumulator to absorb loading shocks while providing positive control of cutting and spreading depths. Two hydraulic cylinders control the bowl. The new scrapers are the model H87, with a capacity of 11 yd heaped; and model H97, with a capacity of 12 yd. Both have 16:00-20 tires.—**American Tractor Equipment Corp., 9131 San Leandro Blvd., Oakland, Calif.**





German Excavator Handles Big Yardage

West German Weserhutte multi-bucket excavators, now available in the United States with capacities ranging from 40 to 580 yph, have long been used in Europe for such jobs as sand and gravel excavation, trench and canal construction and maintenance, and stock piling. A series of dragline buckets ranging in size from ⅞ to almost 9 yd, plus digging depths ranging from 18 to 46 ft, give the unique machines the ability to produce huge yardages continuously in easily handled materials. The excavators can be equipped with built-in screening and washing plants. **—Combined Agencies Corp., 812 Barr Building, Washington 6, D.C.**

Crawler Powers Drill

Power take-offs from a crawler tractor drive Robbins' new rotary drill and a 600-cfm compressor provides air for removing cuttings from 6 to 10-in. blast holes. Down pressure varies up to 60,000 lb. Three leveling jacks allow the rig to be used on 15-deg slopes.**—Robbins Machine & Mfg. Co., Box 281, Oneonta, Ala.**

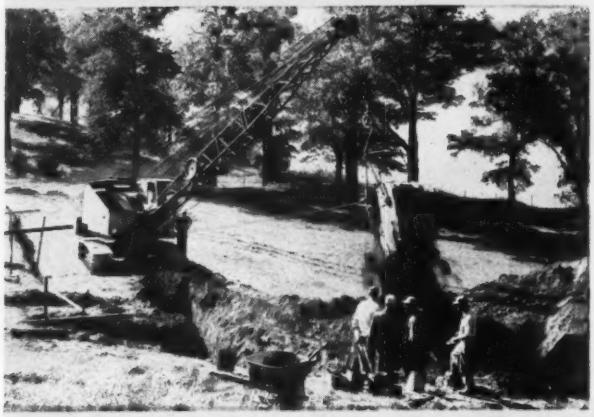
Versatile Roller Now a Sprinkler

A turn of a valve converts Seaman-Gunnison's Duo-Pactor—already an extremely versatile machine—into a sprinkler wagon. The Duo-Pactor pictured uses water ballast that can be gravity-fed to a sprinkler bar. The tank holds 760 gal, which brings the weight of the unit to 25,390 lb. The Duo-Pactor already combines steel and rubber compaction in one unit. Optional sheepsfoot rollers that replace drive wheels and a vibratory unit increase the machine's range.**—Seaman-Gunnison Corp, Milwaukee, Wis.**

continued on page 197

NOW...THE LORAIN-26

offers you even more new advantages



More and more quality features are being added constantly to the heavy-duty, 3/4-yd. Lorain-26 to put it even further ahead in high-speed production and lower maintenance.

For instance, today all Lorain-26's are equipped with an improved, vertical swing shaft, mounted on anti-friction bearings. Also, all horizontal and vertical power shafts, except the infrequently-used boom hoist, now revolve on anti-friction bearings. Even the turntable rollers are so mounted.

Draglines are now equipped with a new style, fully revolving trunnion-type fairlead that adds weeks to cable life.

And look at these additional features . . . *"E-Z" action operating controls on anti-friction bearings —five identical operating clutches—Hydra-Ease power operation of all crawler functions—the exclusive square-tubular-chord crane boom for lifting more at greater reaches—optional extra-wide crawler for even greater crane capacity—extra-strong, precision drop-forged treads—hydraulic coupling or torque converter.*

You get all these advantages in this feature packed, heavy-duty 3/4-yd. machine that already has proven itself in the field. Also, investigate the top-notch service and parts facilities of your Thew-Lorain Distributor. His contribution to years of trouble-free operation is another part of what you get when you buy a Lorain.

THEW LORAIN® *reliability in action*

THE THEW SHOVEL CO., LORAIN, OHIO, U.S.A.

Manitowoc Adds 3-yd Shovel

Manitowoc's new 3-yd excavator features a three-stage torque converter coupled to a diesel engine equipped with a tail shaft governor. Basically a shovel, the model 3600 converts to a crane, clamshell, or dragline. Only 14 gears power the entire upper machinery and these gears turn only when working, a feature that reduces power loss. Air controls operate all front-end functions, as well as steering. Other features include a self-removing counterweight and self-cleaning treads.—**Manitowoc Engineering Corp., Manitowoc, Wisc.**

Mixer Has Front-Axle Drive

FWD's model C86-707 ready-mix concrete truck features driving power to the front axle of its front tandem assembly as well as to both axles of its rear tandem. Equipped with a mixer powered by its own engine, the truck has a capacity of up to 10 yd. The six-wheel-drive truck features FWD's torque-proportioning differential, which distributes one-fifth of the drive-line torque to the forward axle while the remaining four-fifths goes to the two driving axles of the rear tandem.—**Four Wheel Drive Auto Co., Clintonville, Wisc.**

Aluminum Mixer Truck Tested

A test model of a ready-mix concrete truck built entirely of aluminum except for the drive train has been produced by Construction Machinery Corp. The Transcrete mixer employs a standard design, except that a few components have been modified slightly to take advantage of weldable aluminum alloys. Components are said to have the same strength as those constructed of steel. As an example of the savings in weight, chute sections weigh almost one-half less than conventional steel chutes. —**Construction Machinery Co., Waterloo, Iowa.**

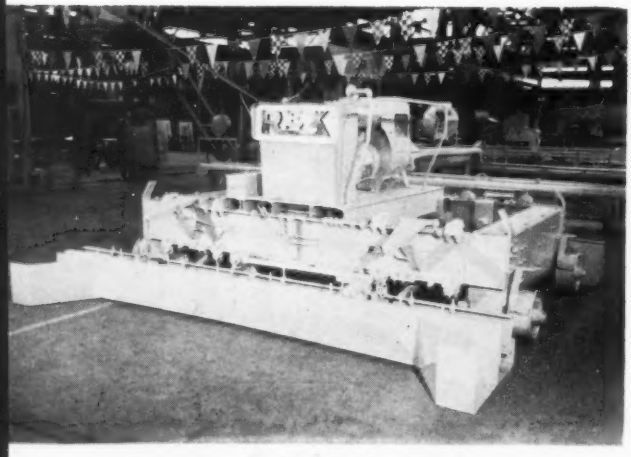
Four-Wheel Drive Adds Power

Napco's four-wheel-drive, four-wheel-steer tractor, called the Crab, gives 45% more drawbar pull than its two-wheel-drive counterpart without increasing its size or weight. A three-position selector allows the operator to choose front-wheel steer, rear-wheel steer, or oblique steer (both front and rear wheels turned in the same direction). Available attachments include a backhoe, forklift, loader, post-hole digger and dozer.—**Napco Industries, Inc., 7th St & North Lyndale, Minneapolis 11, Minn.**

continued on next page

Galion Combines Electric Vibratory Compactor With Grader

Galion now offers their model 503 motor grader equipped with a Jackson electric vibratory compactor, a combination that greatly increases the job range of both machines. Tests prove that the vibratory compactor performs more effectively when working over graded surfaces. The Jackson unit consists of four 26-in. wide electric vibrating compactors that are connected by drawbars to the head block of the grader. The mounting system protects the grader against vibration. The compaction unit is raised or lowered hydraulically (above, left) from the grader operator's platform. An independent engine and generator, mounted at the rear end of the grader frame, power the compactor, which is capable of delivering 4,200 three-ton compaction blows per min. The exclusive Jackson system that allows manual operation of individual compacting heads is retained in this unit. Any single compacting head can be detached and fitted with an operating handle to convert it into a self-propelled compactor for use on small jobs.—**Galion Iron Works & Manufacturing Co., Galion, O.**



Rex Finisher Is Improved

The latest Rex concrete finishing machine features improved operator visibility, centrally located controls, and automatic steering on radius work through a differential steering system. A choice of manual or hydraulic frame widening is offered. When frame widening is done manually, a new clamping system eliminates the need for adjusting nuts or bolts. A variety of speed selections are available quickly through an automotive-type transmission.—**Chain Belt Co., 4701 W. Greenfield Ave., Milwaukee, Wis.**

Equipment continued on page 200

Track Press Does Fast Job

OTC's quick-acting track press pushes pins and bushings simultaneously, a feature that reduces damage to track components. A hydraulic winch draws track along a conveyor to an indexer that aligns links in the saddle of the press. Then, in one 2-in. stroke (see inserts), hydraulic pressure up to 125 tons is applied to ease pins and bushings out of sidelinks. The one-man operated press, called the Trackmaster, has only three interlocked controls that work only in the proper sequence.—**Owatonna Tool Co., 380 Cedar St., Owatonna, Minn.**

NEW...

POWER-PACKED CHAMPS OF THE AIR-COOLED ENGINE FIELD

by HERCULES

HERCULES C2-90D
Design by Lycoming
35 HP; 274 pounds, dry

HERCULES CV4-180
Design by Lycoming
70 HP; 463 pounds, dry

No other industrial air-cooled engines pack the horsepower/pound of these two- and four-cylinder models. Modern design gives them 40-90% more HP per cubic inch displacement. Add to this high usable power, the economy of these engines . . . up to ⅓ in fuel savings over competitive engines . . . and you've got an unbeatable combination for your equipment power or power-unit applications.

The Hercules industrial air-cooled engines of Lycoming design have the dependability and endurance for which the Lycoming name is famous in aircraft engines. Crankshaft design is oversize and all bearings are of the replaceable type. With overhead valves, "top-overhaul" is fast and simple on these Hercules units; in fact, complete engine rebuild can be accomplished without removing the engine from its mountings.

Lubrication is by force-feed system with the oil fed from the crankcase to the engine's moving parts by gear-type pump through a pressure relief valve.

Available as engines or complete power-units, with accessory equipment to match service conditions, these engines have been refined by Hercules and are backed by Hercules reputation for quality, stamina and engineering excellence. Prompt service is available through Hercules world-wide distributor organization.

For further information, write Hercules Motors Corp., Dept. 100, Canton 2, Ohio. Other Hercules engines from 5 to 475 HP.

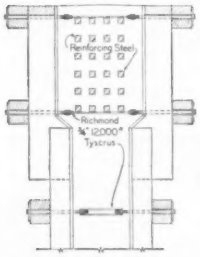
HERCULES

HERCULES MOTORS CORPORATION
Canton, Ohio

anchor walls

Richmond Tyscrus perform double function in unique hangar construction

The top walls of this air line hangar building at New York International Airport – built by Corbetta Construction Company – act as anchors for the steel cables which will support cantilever roofs over hangars on both sides. Richmond Tyscrus, at 4′ x 2′ spacing, hold the forms in place for a full-height continuous pour of these 12″ x 30′ x 100′ anchor walls. In addition, the Tyscrus support the reinforcing steel cages of 24 1⅝″ square bars, thermit-welded to provide 100 ft. long continuous reinforcing in the top beams of each wall. Weight of this reinforcement runs around 240 lbs. per foot.

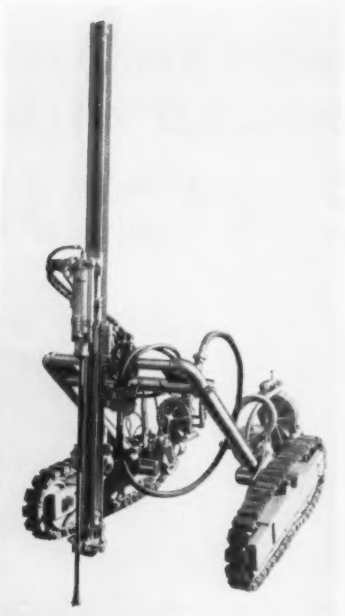


TOP SECTION, ANCHOR WALL

An ingenious system of pouring pockets in the forms permitted easy access to the Tys for installing Tylags on the closing side. Assembly and stripping of forms was fast; Richmond 2-strut, ¾″ Tyscrus (published safe load 12,000 lbs., ultimate strength 20,145 lbs.) have self-cleaning threaded connections.

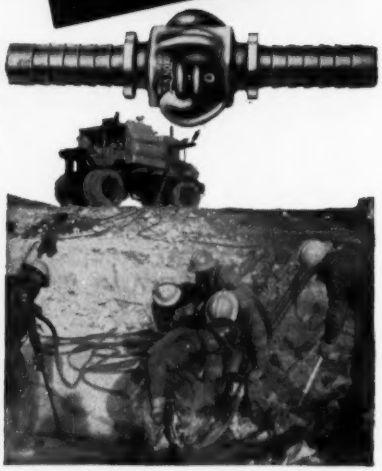
The new Richmond Handbook describes the full line of Richmond-engineered tying devices. Write to: RICHMOND SCREW ANCHOR COMPANY, INC., 816 Liberty Avenue, Brooklyn 8, N. Y. or 315 So. 4th St., St. Joseph, Mo.

EQUIPMENT NEWS...
continued



RUGGED DRILL—A new air-powered, track-type drill rig designed for hard rock drilling in rough terrain has been developed by the LeRoi Div., Westinghouse Air Brake Co. Called the LWD-400 Rock Cruiser, the new drill features a special U-bar design and big air motors that make it ideal for heavy drilling in hard-to-get-at places. Other features include automatic brakes, a geared final drive, spring-loaded track take-ups, built-in line oiler, and life-time lubrication. The feed shell, driven by an air motor, has a standard 10-ft travel. Drills are available in 3⅛, 3¼, and 4-in. diameters. The special U-bar construction provides drilling through a 105-deg vertical boom arc. The drill feed can be placed flat on the ground for toe hole drilling; 7-ft above the ground for horizontal breast hole drilling; or in the vertical position for down hole drilling. Independent movement of each track is obtained by hydraulically controlled track oscillation. Each track is covered with rubber cleats and powered by an individual 7½-hp air motor. The feed is powered by an air motor of double lobe construction; a seven-blade rotor provides alternate power from opposed power lobes. This produces 14 power impulses during each revolution of the motor. Immediate air pressure from

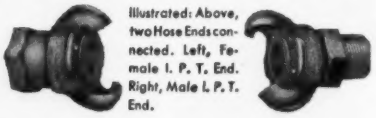
Quick Action...and Tight, Pressure-Proof Connections



"AIR KING"
Quick-Acting, Universal
HOSE COUPLING

FOR COMPRESSORS, ALL TYPES OF AIR TOOLS, WATER, OIL AND SPRAY SERVICE

This versatile coupling is built along plain, rugged lines to assure long, trouble-free service under severest working conditions.



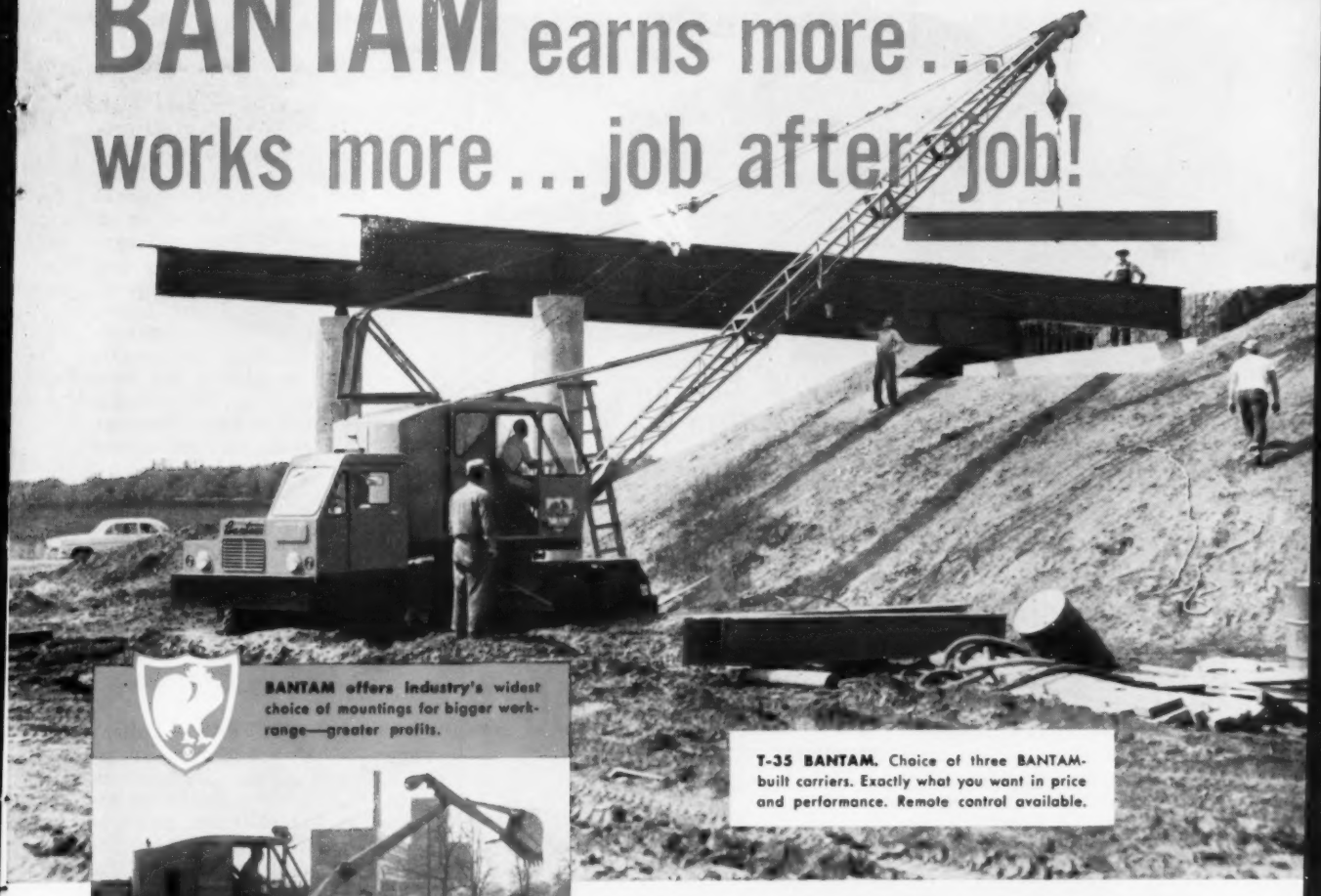
Illustrated: Above, two Hose Ends connected. Left, Female I. P. T. End. Right, Male I. P. T. End.

The "Air King" will reduce operating costs wherever quick connections are required. Locking heads are identical for all sizes of hose or threaded ends within the coupling's size range, and are locked by pressing together and applying a quarter-turn. Equipped with patented Safety Locking Device. Bronze or rustproofed malleable iron, in sizes up to 1".

Stocked by Manufacturers and Distributors of Industrial Rubber Products

DIXON
Valve & Coupling Co.
GENERAL OFFICES & FACTORY—PHILADELPHIA 22, PA.
BRANCHES—CHICAGO · BIRMINGHAM · LOS ANGELES · HOUSTON
DIXON VALVE & COUPLING CO., LTD., TORONTO Associate Companies
Buck Iron Company Inc. Quarryville Pa. · Precision Drawn Steel Company, Camden N.J.

BANTAM earns more... works more... job after job!



BANTAM offers industry's widest choice of mountings for bigger work-range—greater profits.

T-35 BANTAM. Choice of three BANTAM-built carriers. Exactly what you want in price and performance. Remote control available.

C-35 BANTAM—all of BANTAM's famed work speed on the most trouble-free crawlers. Greater ground contact surface, higher flotation.

CR-35 BANTAM—the new and needed contractor's tool. One-man, one-engine operation. Easy traveling, fast working. Mounts all attachments.

Visit your friendly BANTAM DISTRIBUTOR . . . see how BANTAM benefits your picture better!

Contractors vote the BANTAM their top choice year after year!

Such overwhelming acceptance proves BANTAM's superior earning power . . . its bigger return per dollar invested!

BANTAM's high-income return comes from its big job-range versatility. It's the shovel-crane *you* will use most because it's sized right and built right for rapid travel and hard work. It handles more jobs . . . does them more rapidly . . . and saves more in man-hours and machine operation every time out!

BANTAM, and *only* BANTAM, builds its own complete line of carriers. Only in this way can the lower unit be matched to the full capabilities of the fast-cycling upper—for a perfect working team! Works with any attachment you want. Up to 8-ton capacity.

Yours for the asking! Helpful new specification bulletins on the BANTAM of your choice. Get yours now! Schield-Bantam Company, 298 Park Street, Waverly, Iowa.

World's largest producers of truck cranes and excavators

RC-165

SCHIELD Bantam® Co.

NOW...a quality 12-ton low-bed for less than $2000*!

Here, at last, is a *special* 12-ton capacity low-bed trailer, engineered and built by LaCrosse, to provide *maximum strength and long life with minimum investment.* Using two rugged main beams and full-length outer channels as load-carrying members, the new LaCrosse DFS-12 has an 8′ x 14′ oak deck platform, and a 2′ beavertail to simplify rear loading.

Trailer comes fully equipped with four 8.25x15 14-ply tires, ICC lights, reflectors and 6 lash rings. In addition, you get the same husky 12¼″ x 6″ S-cam brakes used on all standard LaCrosse low-beds — and proved by tests to be the safest, *smoothest-running brakes on 15″ wheels.*

So why gamble with unknown, "make-shift" trailers — just to save money — when you can get this quality-built LaCrosse DFS-12 — *PLUS a one-year warranty* — at no extra cost.

*Plus taxes, FOB LaCrosse, Wis. (Subject to change)

Mail for more facts

LaCROSSE TRAILER CORP., Dept. C114, LaCrosse, Wis.

Tell me more about LaCrosse Trailers (..... ton capacity)

☐ Std. Low-Bed ☐ Tilt-Type ☐ Removable Gooseneck

☐ Send name of nearest LaCrosse Trailer Distributor

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Address .....

City ..... State.....

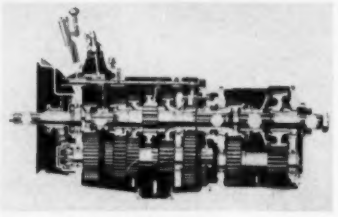
LC-49

Heavy metal fabrication since 1865

LaCROSSE

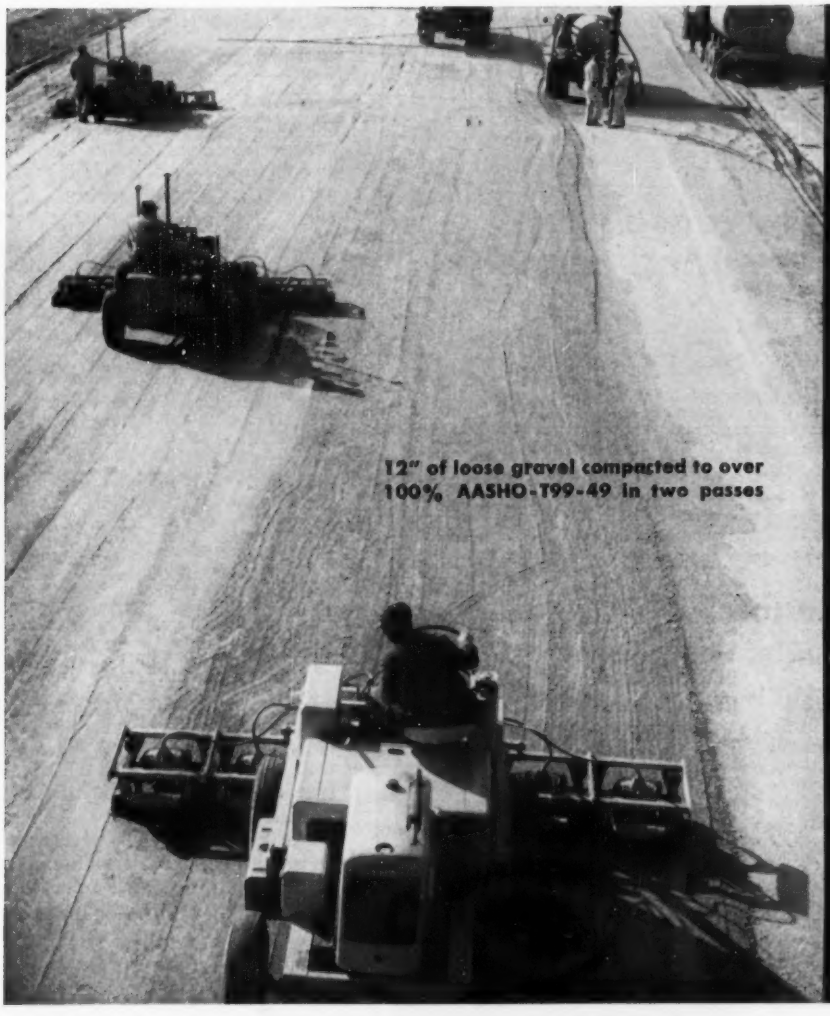
... the low-bed backed by a 1-year warranty

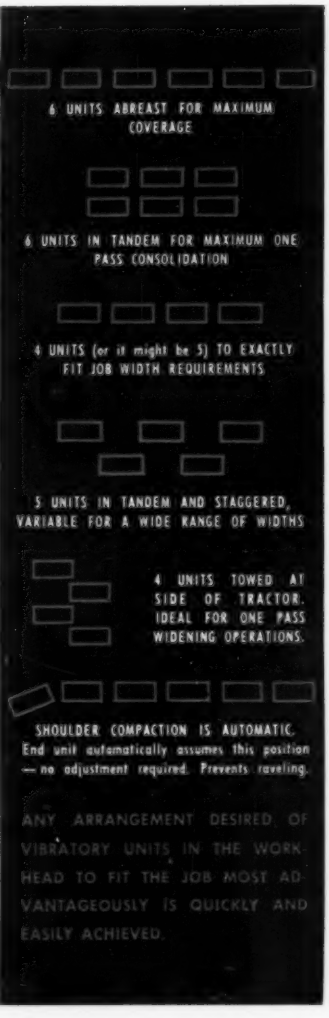
blade to exhaust assures high torque. A chain take-up adjustment provides smooth feed. The 10-ft standard feed travel allows 8-ft steel changes, but optional feeds allow steel changes up to 18 ft. The length of the carriage with the boom horizontal is 8½ ft. With the boom vertical, the carriage is 6½ ft long. Tracks are 6 ft long. A 2 2/3-ft clearance is provided through the middle of the rig. Weight of the 4-in. Rock Cruiser with a DR40 feed is 3,750 lb.—**LeRoi Div., Westinghouse Air Brake Co., Milwaukee 1, Wis.**



FOR EARTHMOVERS — Fuller's new R-1550 RoadRanger transmission—especially designed for big earthmovers—is rated for engines up to 1,550-cu in. displacement producing up to 600 hp. The semi-automatic transmission has nine forward ratios, including direct drive in eighth gear, and two reverse ratios — all controlled with one gear shift lever. The nine selective gear ratios are evenly and progressively spaced. There is no gear splitting. Range shifts are pre-selected, automatic and synchronized. — **Fuller Mfg. Co., Transmission Div., Kalamazoo, Mich.**

BETTER GREASE—A new molybdenum disulfide grease called Gulflex Moly is now being marketed by Gulf. The grease is a multi-purpose lubricant recommended for chassis lubrication jobs including water pumps, fittings, king pins, shackle bolts, torsion suspension bushings, striker plates, and fifth wheels. The proved performance of molybdenum disulfide as a dry lubricant for heavily loaded and slow moving metal parts led Gulf to experiment with its use as an additive in grease. Tests showed that the moly-sulfide particles combine to act as a safety backstop by adhering to opposing metal surfaces under the stress of motion that wears away con-




6 UNITS ABREAST FOR MAXIMUM COVERAGE
6 UNITS IN TANDEM FOR MAXIMUM ONE PASS CONSOLIDATION
4 UNITS (or it might be 5) TO EXACTLY FIT JOB WIDTH REQUIREMENTS
5 UNITS IN TANDEM AND STAGGERED, VARIABLE FOR A WIDE RANGE OF WIDTHS
4 UNITS TOWED AT SIDE OF TRACTOR. IDEAL FOR ONE PASS WIDENING OPERATIONS.
SHOULDER COMPACTION IS AUTOMATIC. End unit automatically assumes this position — no adjustment required. Prevents raveling.
ANY ARRANGEMENT DESIRED OF VIBRATORY UNITS IN THE WORK-HEAD TO FIT THE JOB MOST ADVANTAGEOUSLY IS QUICKLY AND EASILY ACHIEVED.

JACKSON COMPACTORS

MORE OF THEM USED ON AMERICAN TURNPIKE PROJECTS THAN ALL OTHER PAN-TYPE COMPACTORS COMBINED!

The reason is two-fold. 1. The JACKSON, with its tremendously powerful vibratory action, provides 100% of specified density of any material normally used in macadam base or sub-base courses in the shortest possible time. Each unit in the workhead supplies 4200 THREE-TON BLOWS per minute. 2. IT'S FAR MORE VERSATILE THAN ANY OTHER COMPACTOR, ideally adjustable to each and every job requirement. Coverage is what you want it to be, up to 13', 3". Any arrangement of the compactor units, as indicated at right, is quickly attainable. With this machine you can compact areas others can't touch, a factor that eliminates lost motion and saves a great deal of time and money. And, of course, it is equally effective on all types of granular soil fills and similar projects. By all means inspect it at your Jackson distributor.

AND FOR SPOTS OTHERS CAN'T REACH

Any of the compacting units in the Jackson Vibratory Compactor workhead can be fitted with operating handle and used exactly like the nationally renowned Jackson Manually Guided Compactors. Perfect for getting into odd spaces and close to walls, etc. — spots that can't be reached by other equipment. One man with a twin hookup of two of these units will compact up to 1,200 sq. yds. of granular soils in 6" layers per hour.

FOR SALE OR RENT AT YOUR JACKSON DISTRIBUTOR

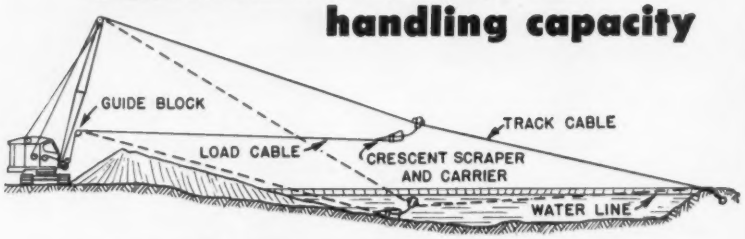
— name and descriptive literature sent on request.

JACKSON VIBRATORS, INC.

LUDINGTON • MICHIGAN

the SAUERMAN METHOD...extends the reach of your crane

the CRESCENT SCRAPER...increases its handling capacity



Drawing shows crane using Crescent Scraper and carrier with a track cable. This arrangement increases effective digging range and permits gravity return to the excavation for a faster operating cycle. Maximum operating span is governed only by amount of cable that may be reeved on the drag drum.

Use This Fast, Economical Method For:

Cleaning Ponds
Trenching Streams
Sludge Removal
Cleaning Under Bridges
Building Reservoirs
Beach Construction

Any crane can handle a Crescent Scraper larger than its regular dragline bucket. Smaller units can increase their capacity about 50%. Large cranes can usually double their capacity. When the boom is supported by a strut or outrigger, a Crescent of still greater size can be used. Arrangements of this type have increased rated crane capacity as much as 4 to 1.

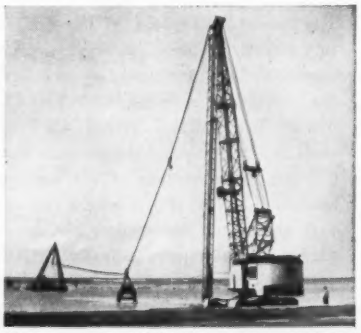
The Crescent hauls its load on the ground and the load is automatically deposited when the bucket is raised. Only the empty scraper bucket is lifted by the crane.

When a crane is equipped with a track cable, Crescent and carrier, it can reach farther, dig deeper under water or from soft areas without the nuisance of mats. Anchorage for the track cable may be fixed—or movable to provide easy shifting to a new line of operation. A tractor makes an excellent mobile anchorage.

Although the track cable method is best for increasing your machine's range, the Crescent can also be cast like your regular bucket.

Get the facts on how much the capacity of your crane can be increased. Give us the make, model and boom length. Ask for Field Report 228 and Catalog J. Catalog T tells how to use Crescents with tractors.

This Indiana contractor used the track cable method with a 1¼-cu. yd. Crescent Scraper to trench across a river. After the water main was placed, the scraper backfilled the trench.



Boom support enabled this crane to use a larger Crescent. After a sub-grade of coral was placed, the 4-yd. scraper was reversed and used to grade the beach. Barge-mounted winch served as anchorage for track cable and supplied power to scraper on grading operations.

Important to Users of Blocks and Fittings: Get the new Sauerman bulletins showing the complete line of Wire Rope Fittings and Durolite Sheaves available from stock. Ask for Bulletins 164 and 165.

SAUERMAN BROS., INC. 612 SO. 28th AVE. BELLWOOD, ILL.

Crescent Scrapers • Slackline and Toutline Cableways • Durolite Blocks

EQUIPMENT NEWS...
continued

ventional lubricants. The new product is distributed in 120 and 400-lb drums and in 35-lb pails. **—Gulf Oil Corp., Pittsburgh.**

BIGGER RAM—A new 100-ton capacity hydraulic ram has been added to the Simplex Re-Mo-Trol line of hydraulic center hole pullers. Called the model RC-1122, the ram offers a full 22 in. of travel. The ram is particularly adaptable at applying tension when pre-stressing concrete because the full rod stretch can be achieved in a single operation, even in long-bed production jobs, thanks to the long travel area. When located at the point of operation or at a remote point, the ram can be operated by hand or by electric, gasoline, or air-powered pump. The ram can be rigged for pulling through center hole or for pushing. The unit, which weighs 265 lb, is equipped with four carrying handles that are welded to the cylinder housing. Over-all height of the unit is 33 in. and the housing dia is 7½ in. The Simplex line now includes 12 models ranging from 10 to 100-tons capacity.—**Templeton, Kenly & Co., Broadview, Illinois.**

EASY OPERATION—Two-lever, "joy-stick" controls are now available for the Lorain-26, a crawler-mounted excavator with a ¾-yd rating as a shovel and a 17½-ton rating as a crane. The two levers hydraulically control swing, travel, hoist, crowd and retract; and also handle load lowering and boom derricking. The Lorain 26 is the last in the Thew line to be equipped with joy-stick controls. When used as a

FREE WIRE ROPE RECOMMENDATIONS TO HELP YOU SAVE MONEY

Prepared by Experts, Booklets Give Specialized Wire Rope Uses in 5 Fields

What do you do when you have to decide what rope to order? Do you rely on your memory or look up the last order?

Here's an easy way to get the right answers *fast.* Refer to the Wire Rope Recommendation Booklet prepared by HAZARD engineers as a result of years of work in the field with every kind of machine that calls for wire rope. There's a different booklet for each of five basic industries—general contracting, industrial, mining, logging and marine. We'd like you to have these booklets for quick reference because they'll save you time and money by giving you the right answer of the right rope to use for any job in your field.

Written in clear, non-technical language, these new booklets are from 8 to 24 pages long. In addition to detailed wire rope recommendations for your own field, there is a page of LAY-SET wire rope characteristics which explains fully the basic terms of diameter, construction, lay, grade and core . . . all necessary in understanding wire rope nomenclature. Many action pictures of equipment at work also help to show the reader how recommended wire ropes are actually used on the job.

Send today for copies of any or all of the 5 free Wire Rope Recommendation Booklets. Simply check the booklets you would like to receive, in the coupon provided.

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Company _____

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INTERNATIONAL model A-182 with 4-yard dump body is ready for immediate shipment and use.

INTERNATIONAL model ACF-182. Big payload, plus short over-all length and wheelbase, with 8-yard body and tandem axle.

INTERNATIONAL TRUCKS

Immediate Delivery!

Heavy-Duty INTERNATIONAL Dump Trucks ready to roll on your construction job!

Need a truck *right now?* Call your INTERNATIONAL Dealer for immediate delivery from the INTERNATIONAL *Truck Factory Inventory Pool.*

You can select the construction dump truck you need with the equipment you want, fully assembled, all ready to back under the shovel. Choose from conventional or cab-forward models complete with bodies, hoists, frame reinforcements, tow hooks, double-faced front directional signals, rear view mirrors both sides, heater-defrosters and oil filter.

You can have any or all the following optional equipment installed in a matter of hours: cab protectors, extension sides, swinging partitions and spreader aprons.

Keep your job moving on schedule—call your INTERNATIONAL Dealer now!

4 MODELS TO MEET YOUR NEEDS

Conventional trucks: INTERNATIONAL model A-164 with 4-yard dump body, 129-in. w.b., 264 cu. in. engine, 15,000 lbs. 2-speed rear axle, heavy-duty springs, oversize brakes, 8.25 x 20 10-ply tires. 19,000 lbs. GVW.

INTERNATIONAL model A-182 with 4-yard dump body, 141-in. w.b., 308 cu. in. engine, 16,000 lbs. 2-speed rear axle, heavy-duty springs, double oversize brakes, 9.00 x 20 10-ply tires. 21,000 lbs. GVW.

Cab-forward trucks: INTERNATIONAL model AC-1892 with 5-yard dump body, 137-in. w.b., 308 cu. in. engine, 5-speed, constant-mesh transmission, 18,500 lbs. 2-speed rear axle, oversize brakes, 10.00 x 20 12-ply tires. 25,500 lbs. GVW.

INTERNATIONAL model ACF-182 with 8-yard dump body, 149-in. w.b., 308 cu. in. engine, 28,000 lbs. tandem drive rear axle, oversize brakes, 9.00 x 20 10-ply tires. 33,000 lbs. GVW.

cost least to own!

INTERNATIONAL HARVESTER COMPANY, CHICAGO

Motor Trucks • Crawler Tractors
Construction Equipment • McCormick® Farm Equipment and Farmall® Tractors

Lubriplate No. 630-2 is a high temperature, extreme pressure, water-repellent, grease type lubricant. Ideal for the general lubrication of Industrial, Automotive, Construction, Farm and Marine Equipment. Lubriplate Grease Gun Cartridges provide an easy, quick, economical means of application. Prevent the waste and mess of hand filling. Packed 10 Cartridges in a handy carrying carton.

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE

For nearest LUBRIPLATE distributor see Classified Telephone Directory. Write for free "LUBRIPLATE DATA BOOK"... a valuable treatise on lubrication. LUBRIPLATE DIVISION, Fiske Brothers Refining Company, Newark 5, N. J. or Toledo 5, Ohio.

EQUIPMENT NEWS...

continued

crane, the model 26 now can be equipped with the new internal gear boom hoist that is found on bigger Lorains. It includes a final planetary gear reduction drive to the drum that gives greater precision by providing slower speeds and improved control. A new, larger boom hoist drum accommodates heavier derricking cable and gives increased cable winding capacity.—**Thew Shovel Co., Lorain, O.**

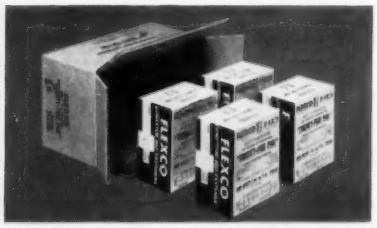
WALK OR RIDE—Whiteman's new powered concrete buggy allows the operator to either walk behind the machine or to ride on a fold-down platform. Called The Walk-or-Ride buggy, it has a concrete capacity of 10 cu. ft. Compact and lightweight, it is designed to travel easily over narrow runways, in elevators, and through doorways as narrow as 31 in. The machine features a positive-control dumping mechanism that is said to facilitate concrete handling. Powered by a Wisconsin engine, the new buggy has front-wheel chain drive, automatic clutch, and reverse drive. Top speed is around 5 mph. The buggy is also available with a flat body.—**Whiteman Mfg. Co., 13,-020 Pierce St., Pacoima, Cal.**

GRADER TIRE—Firestone's new road grader tire is said to cut vibration to a minimum, thereby eliminating the troublesome wave motion that sometimes makes precision grading difficult. Called the Roadbuilder, the tire has a wider, flatter tread and rugged traction bars that provide a better gripping action on all types of surfaces. The body is constructed of treated nylon cord. Other features of the new tire design are said to provide for good self-cleaning and smoother operation at high speeds. The new tire is available in both tubeless or tubed types. — **Firestone Tire & Rubber Co., 1200 Firestone Parkway, Akron 17, O.**

TWENTY-FIVE COMPLETE SETS OF FLEXCO HD BELT FASTENERS NOW AVAILABLE IN ONE EASY-TO-HANDLE ECONOMY BULK PACKAGE

There's no need now to carry several 10-set boxes to the job—every "25-PAK" contains 25 complete sets of FLEXCO Fasteners (bottom plates, top plates, clips, nuts and bolts) . . . enough FLEXCO Fasteners to join common belt widths (for example: one "25-PAK" box, size 1½E, will join a 36" belt.) Our savings from bulk-packaging are passed on to you!

Label on each "25-PAK" box has chart indicating the number of FLEXCO HD Fasteners to use for given belt widths.



Standard shipping carton contains four "25-PAK" boxes of one size fastener. Keep a supply of "25-PAKS" on hand. Easy to store and inventory, sturdy boxes and shipping cartons have many uses.

Ask your FLEXCO distributor or write to us for additional information.

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STEEL LACING COMPANY

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FOR THE SPLICE OF A LIFETIME

BELIEVE IT OR NOT!

this is all you pay for a new

CASE® "320" LOADER-BACKHOE

THE BIG SURPRISE is in THE PRICE TAG

(Even lower than most converted farm tractors with light-duty attachments)

See and Compare it before you buy!

A free demonstration will quickly convince you that the new Case "320" industrial rubber-tired loader-backhoe *will outperform and outlast any competitive rig on the market.* In addition, it will save you hundreds of dollars in first cost because the entire unit — tractor, loader, backhoe, even the engine — is *built and factory-mounted by Case,* with only one manufacturing profit. There are no "hidden extras" . . . no messy split responsibility on warranty or service. So, by all means, if you are in the market for a wheel-type loader-backhoe, call your nearest Case Industrial Dealer. Let him *demonstrate* the advantages of the new Case-engineered, Case-built "320" — *before you buy!*

CASE INDUSTRIAL®

1st in Quality for over 100 years

Clip . . . mail for quick action

Look at the EXTRA FEATURES you get for ONE LOW PRICE!

1. Complete machine engineered and built as a HEAVY-DUTY INDUSTRIAL UNIT — not just a converted farm tractor with light-duty attachments.

2. Effortless power-steering— enables you to turn front wheels with two fingers—even when tractor is standing still.

3. High-speed shuttle transmission — lets you go forward or back up (at 27% faster reverse speeds) — without shifting gears.

4. Heavy-duty ONE-PIECE drop-forged front axle — instead of conventional three-piece axle.

5. Deep box-section hoe-boom and dipper-stick — stronger by far than competitive backhoes.

6. Hydraulic foot-pedal swing control — cuts cycle time, swings boom full 180°.

7. Extra-wide telescoping stabilizers — anchor tractor firmly on hillsides and when digging hard ground.

8. Husky ½-yd. loader bucket — has automatic power-leveling, 60° grading angle.

9. Cushioned backrest seat (instead of steel "plow-bucket") — flips over instantly for operating backhoe or loader.

NOTE: These are just a few of *more than 35 exclusive features* you get with the Case "320" wheel-type loader-backhoe.

J. I. CASE CO., Dept. C149-8, Racine, Wis., U. S. A.

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C-BL-60K

Onan ELECTRIC PLANTS

ELECTRIC PLANT NEWS

Onan ELECTRIC PLANTS

Here's how Onan Portable Power pays you added profits!

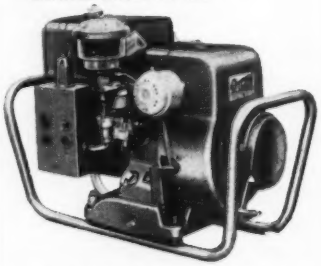
Gives you cost-cutting power on the job . . . *from the start*

Carry, truck or wheel in an Onan and you're all set with plug-in power for the whole crew. No wasting time with hand tools . . . no waiting for utility lines. If you're not using electric power *full time* chances are you're losing more money than the cost of several Onan plants.

4-cycle, season-long dependability

Onan plants are rugged . . . built to take abuse from weather and workmen. Special cast-iron block Onan engine and drip-proof all-climate Onan generator are direct-connected in a rigid, compact, smooth-running unit. Out-perform and outlast "assembled type" plants using general purpose engines. *Special contractor models from 500 to 10,000 watts.*

2500-watt model serves crew of 3!



Model 205AJ-1P, most popular Onan unit with residential contractors. Complete as shown with 4 plug-ins, pilot light, carrying frame, recoil starter . . . ready to run. Dolly-mounted model also available.

New folder helps you choose the right model for your job. Write today!

See your distributor for a free demonstration

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EQUIPMENT NEWS . . .
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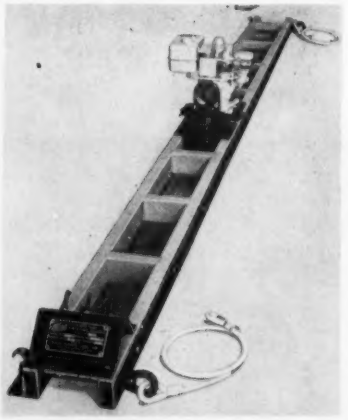
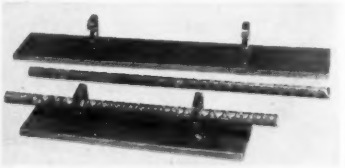


THOR SCREED — A double-acting vibratory finishing screed that vibrates, compacts, and levels concrete through its high-frequency slapping action has been developed by Thor. The new screed has a two-beam design with a steel strapping vibratory mechanism. The unit is powered by a gasoline engine that actuates a series of steel straps between the two beams to deliver the high frequency slapping action on the surface of the slab to force out water and air. Two men can draw the lightweight screed across freshly-poured concrete to produce a dense, compact slab in minutes. The screed's vibrating mechanism is said to remain cool after hours of operation because it transmits the vibration directly instead of through bearings. The unit is available in 7, 10, 13, and 16-ft lengths.—**Thor Power Tool Co., Prudential Plaza, Chicago 1, Ill.**



SPEEDS INSTALLATION—Installation of reinforcing bars up to ⅜-in.-dia, especially in gunite jobs, is said to be speeded when a new end-welded stud developed by the Nelson Stud Welding Div. is used. The new rectangular Re-Bar stud cuts costs of securing reinforcing bars to steel surfaces by eliminating the need for both hand welding of fasteners and bar tying. Instead, studs are end welded in a split second. The

(Advertisement)

Builds expressway thru "city on 7 hills"

One of Foley's new B Fullpaks spreads dirt in smooth, controlled lift, building an approach to expressway overpass at Cincinnati. Fingertip operation of electric-motor-powered blade, apron, and positive-ejection tailgate gives precise control for fast accurate spreading.

Foley Construction Co., Cincinnati, works four 27-yd. B Fullpak scrapers, with two 25-yd. earlier "B's" and one 16-yd. C Tournapull, in a hillside cut for new 10-mile Cincinnati expressway. Fullpaks heap capacity loads in short 100′ cut, haul downhill to build overpass.

If you've ever been to Cincinnati, you'll appreciate the fact that building express highways there is a man-size job. Like old-world Rome, Ohio's "Queen City" is built on 7 hills. And its vast suburban expansion — continuing growth to the north, east, and west — extends into terrain perhaps even more rugged and hilly.

Moving 1,800,000 yds.

Across these hills, Foley Construction Co., Cincinnati, is building 3 sections of a 10-mile express highway for the State Highway Department. When completed, this new expressway will connect the Northeast Freeway with the main city area. Later, the highway will be extended into the downtown business section, and link with freeways to be built in northern Kentucky. Foley's contracts include 1,800,000 cu. yds. of dirtmoving . . . plus drainage, bridges, overpasses, and paving. Completion is scheduled for late 1958.

Hillside cut-and-fill

Contractor's 4 new LeTourneau-Westinghouse B Tournapulls® with 27-yd. Fullpak® scrapers — in company with two earlier 25-yd. "B's" and a 16-yd. "C" — are shown moving dirt on a city hillside, to build the approach to an overpass. Push-loaded, new "B's" got heaped capacity loads of sandy clay within a short 100′ cut. Dirtmovers hauled 1900′ on favorable grades, spread on the run, made sharp U-turns and quickly returned uphill.

Records show high output

Supt. Harry Combs reports that dirtmoving is ahead of schedule, says, "We're very well satisfied with our new B Fullpaks. They're giving us all the output we could expect from any scraper. And they've cut our costs at the same time." Contractor's records for the previous day show that on an average 2500′ haul, the 5 "B's" and one "C" moved 351 loads of dirt in 9 hours.

Fullpak bowl loads faster

Foley Constr. Co. finds the new Model B's with big, 27-yd. Fullpak bowls, pack full capacity, low-void payloads fast. Dirt flows easily into low, wide scraper bowl. Bottom has only 1° rise, so less power is required for *lifting* material. More pull force can be applied to *cutting* . . . and results in faster heaping of more pay-yards per load.

With the new "B" you also have a choice of 10-speed step-gear transmission, or Allison Torqmatic (torque converter with power shift) drive to best suit your normal working requirements. You pick the drive that lets you haul at highest speeds, get more loads per hour on *your* kind of work. Call or write for complete information.

BP-1633-DCJ-1

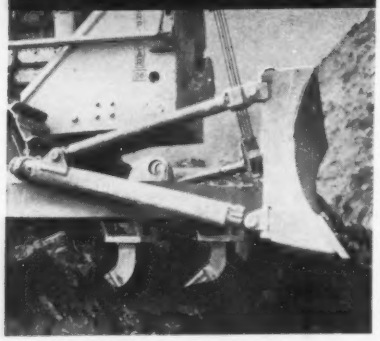
LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

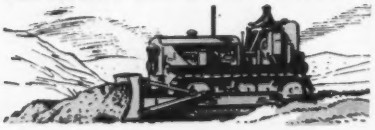
Where quality is a habit

(Advertisement)

MAKE YOUR TRACTOR WORK WHILE BACKING UP!



PRECO *Back-Rippers*



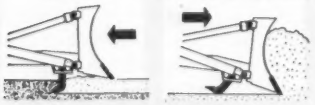
These powerful Rippers work while the tractor is backing up. They convert the bulldozer's deadhead time to work time — conditioning the ground for easier, faster dozing on the next forward pass.

Thousands of Preco Back-Rippers are in use around the world. They save time and have replaced other equipment in building pioneer roads, clearing land and rights-of-way, in gravel pit operations slate breaking in coal strip mines, mounted on pusher tractors for faster scraper loading, for logging operations and many other uses. Quickly installed on most straight and angling blade bulldozers.

See your Caterpillar Dealer or send the coupon for information.

BACK UP RIPPING

EASIER FORWARD DOZING



Preco Back-Rippers are completely automatic in operation — they dig in on the back-up trip and ride on the surface when going forward. There are no controls and, when desired, they can be locked up out of the way.

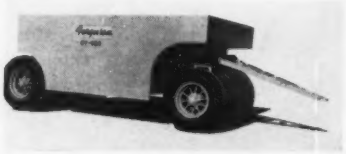
PRECO INCORPORATED
6300 E. Slauson Avenue
Los Angeles 22, Calif.

Name_____

Address_____

EQUIPMENT NEWS . . .
continued

bar is placed in the jaw of the stud and locked into place with a few hammer blows. The new stud, called type RL4, measures ¾ in. wide and 3/16 in. thick. The recommended minimum distance from the weld base to the edge of the jaw (the distance the bar will be held away from the steel) is 7/16 in.—**Nelson Stud Welding Div., Gregory Industries, Inc., Lorain, O.**



LINE INCREASED—Latest addition to the Ferguson line of compaction rollers produced by the Shovel Supply Co. is the model RT-900—a towed-type, rubber-tired unit weighing eight tons when fully ballasted. The roller, which can be equipped with either 4 or 6-ply 7:50x15 tires, is equipped with nine wheels—four on the front and five on the rear. Tires overlap to provide complete converge. Timken tapered roller bearings with dust-proof seals are used in all wheels to assure long service without maintenance. The weight of the RT-900 when empty is 2,700 lb. It has a ballast capacity of 104 cu ft and when fully ballasted the unit furnishes eight tons of compaction.—**Shovel Supply Co., Box 1369, Dallas 21, Texas.**

FITS DUMP TRUCKS—A new spreader that fits inside any standard dump body has been announced by the Shunk Mfg. Co. It is designed for placing sand, cinders, stone, chips, and other materials. Hardware for mounting in the dump body is included with the spreader, which can be mounted or dismounted in about the same time it takes to change a tire, according to the manufac-

Gives a Man **Giant** *Strength*

CM PULLER

- **SMALL** Lever is only 20½" long.
- **POWERFUL** 83 lbs. on lever* produces 3,000 lbs. at hooks. *1½ ton model.
- **VERSATILE** "CM-Alloy" flexible welded chain. Lifts or pulls at any angle.
- **PORTABLE** Made of aluminum alloy. ¾ ton model weighs only 14 lbs. **Capacities ¾ to 6 tons.**

A NATURAL FOR CONSTRUCTION WORK!
The "CM" Puller will do a "thousand-and-one" jobs for you. It will do them faster, safer and far easier. The "puller" is compact . . . stores conveniently in a tool box. Lifetime lubricated. Every contractor should have one.

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REGIONAL OFFICES: NEW YORK, CHICAGO, CLEVELAND
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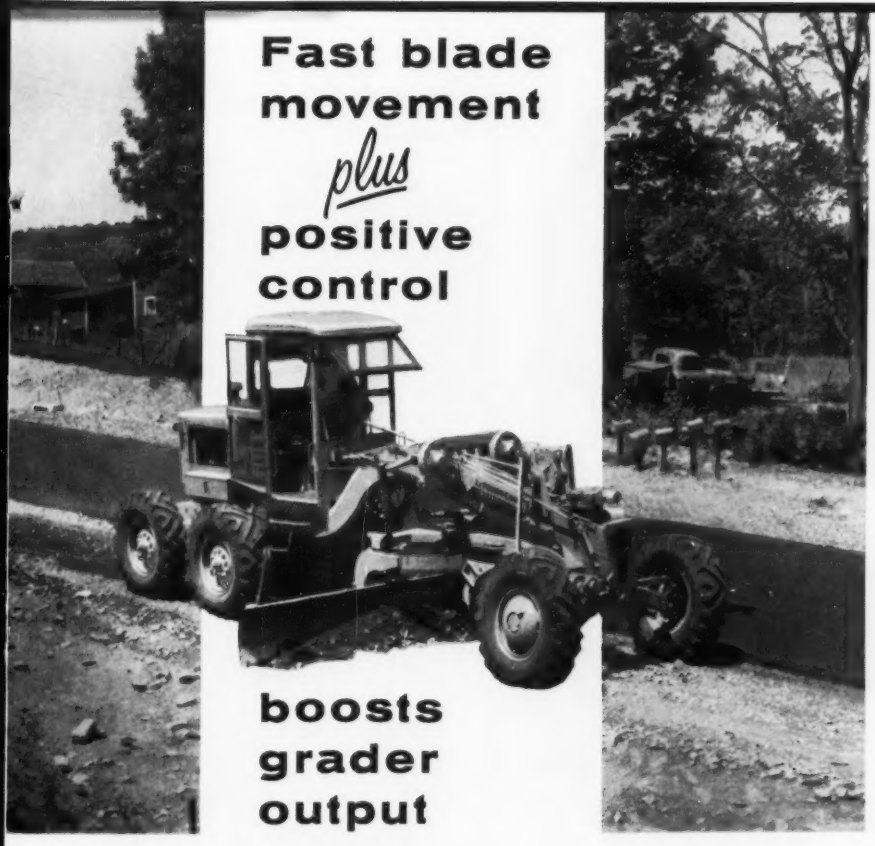
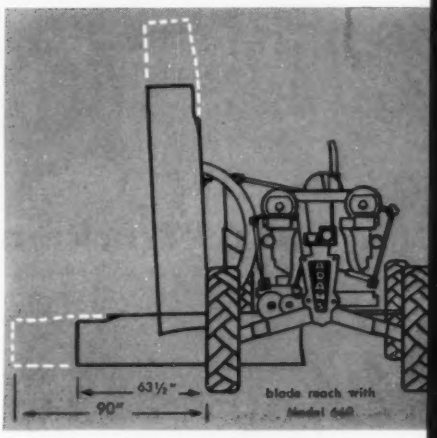
(Advertisement)

Fast blade movement *plus* positive control boosts grader output



Adams 440 dresses-up shoulders along Route 25, near Litchfield, Connecticut. Here contractor John DeMichiel & Bros. Co., Torrington, Conn., reconstructed a section of roadway . . . moved 93,000 cu. yds. of dirt, built new uphill truck-lane, graded, and blacktopped. "440's" smooth, constant-speed blade controls let operator work fast.

You can move the Adams blade to normal operating positions shown in solid outline, without stepping down from the cab. Extra-wide or extra-high reaches shown by broken lines are obtained by operator from cab, after adjusting blade lift-linkage and shifting blade position on the circle. Optional power-shift moldboard shifts blade 26½" right or left on circle, in seconds . . . saves time of extra maneuvering when blading around grade stakes, power poles, along fences, forms, etc.



You'll speed-up grading, move more dirt with your graders and scrapers, when you blade with a heavy-duty Adams*. Fast, easy operation of Adams' moldboard cuts non-productive blade-swing time. And positive blade movement gives your operator complete control. He is relaxed . . . confident of his machine . . . can work at practical, higher-output speeds.

Quick, positive blade control

All blade-positions your operator normally uses are power-controlled from the cab. He has *exact* control, because Adams' blade mechanism is always firm on its sturdy, one-piece, wishbone frame, and operates at constant speed — regardless of the number of controls in use.

Blade positioning is fast . . . from deep ditch-cut to high bank-cut in much less than a minute . . . to other positions even faster. Moldboard turns 360° — clockwise or counter-clockwise — for quick changes from forward work, to reverse ditching and grading. Blade can be reversed while under load.

No stretching for control levers

All Adams grader controls are within easy reach for standing or sitting operation — right in front of the operator. Very little effort is needed to operate blade-control levers. Power-box gears, shafts, and clutches — all move on anti-friction bearings.

Engaging of controls is smooth and fast, because Adams' three-jaw power-box clutches mate without shock or kick-back. Control-shaft universal-joints are roller-bearing type, enclosed, lubricated for life.

Plenty of clearance makes blading easier

Adams graders provide lots of room for moving the blade, without hitting tires, frame, etc. You get jobs completed fast, because your operator gives more attention to grading, less to limitations of machine. He can turn blade, or make a deep cut at sharp angle without special care to avoid cutting tires. He positions blade for extreme shoulder reach, ditch-cuts, or high bank-slopes, without hindrance from mounted scarifier. The moldboard raises high, easily clears ground for climbing out of ditches and passing over grade-crossings. Operator saves time and temper . . . you save possible cost of damaged tires, moldboard, or drawbar and circle assembly.

With its high-arch front axle, heavy-duty Adams graders straddle high-and-wide windrows of dirt, oil-mix, and gravel without interference to steering . . . and without bulldozing material, and wasting power.

Ask for a demonstration

See how ease of blade operation combines with Adams' greater range of working speeds, to outproduce any other comparable grader. 6 sizes — 60 to 190 hp. Choice of Cummins or GM engine on 5 larger models.

*Trademark G-1665-DCJ-1

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

Track Overhaul Time Cut 50%

OTC "Trackmaster" Track Press

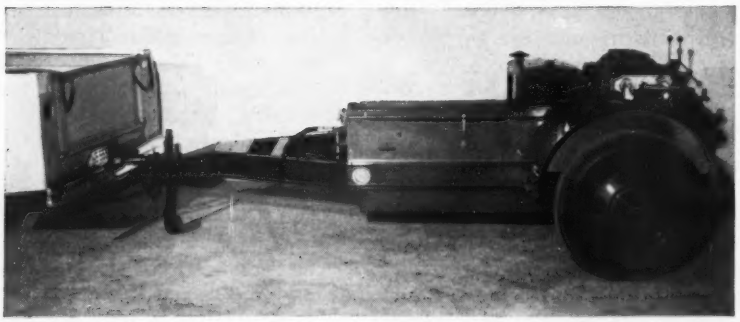
By pressing pin and bushing simultaneously, without broaching or shearing sidelinks, all size tracks can be overhauled faster, safer and easier with the new OTC "Trackmaster" hydraulic track press. With grousers off or on (2 bolts removed), the "Trackmaster" one-man operation does a better job, with complete safety to the operator. Basic specs—ram capacity 125 tons; hydraulic winch—5800 lb. pull; power—either gasoline engine (11.4 hp) or electric motor (7½ hp).

NEW OTC HYDRAULIC-POWERED TRACK-BOLT IMPACT WRENCH

OTC's amazing new impact wrench (1" square drive) eliminates the need for an air compressor or an electric power source by receiving trouble-free hydraulic power from the "Trackmaster" basic hydraulic system.

TRAILER-MOUNTED "TRACKMASTER"

Now—take the "Trackmaster" to the jobsite for faster track work and less downtime. THD Wisconsin gasoline engine (11.4 hp @ 2200 rpm) is standard, although any motor of sufficient horsepower can be used. Trailer width overall: 7'2".

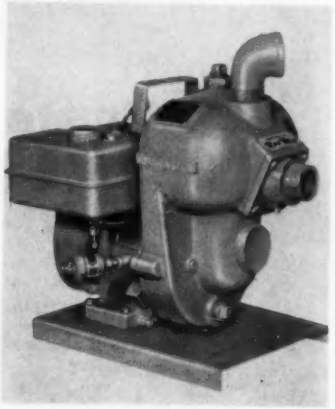


WRITE NOW FOR FREE DETAILED INFORMATION

OWATONNA TOOL COMPANY

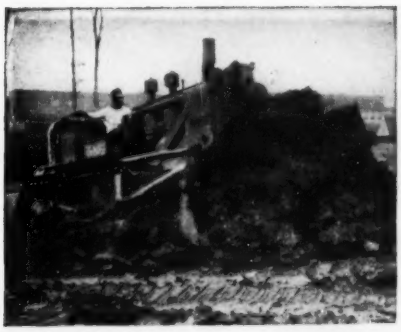
380 Cedar Street • Owatonna, Minnesota

turer. The machine has two spinner shafts that can be adjusted to fit almost any dump body. The shafts extend through sealed tubular housings and operate in oil. Bearings at both ends of the shafts are mounted in a specially designed housing that is said to eliminate any shaft whip that might distort the spread pattern. The spreader, which can be operated from the cab, is available in 5, 6, and 7-yd capacities, and larger sizes can be had on special order.—**Shunk Mfg. Co., Bucyrus, Ohio.**



NEW PUMP LINE—The model 4M is the first in a new line of self-priming contractors' pumps to be produced by Worthington. The AGC-rated pump features an exclusive recirculation port design that eliminates valves and permits the renewal of internal clearances. The centrifugal pump weighs only 45 lb, thanks to the inclusion of many corrosion-resistant aluminum components. Cast iron and steel are used for parts subject to wear.—**Worthington Corp., Plainfield.**

CUMMINS FOR EUC — Euclid Div. has announced the availability of a Cummins engine for its 18-ton rear dump, the model R-18. The Cummins diesel, model NH-6-BI, provides 220-hp and a top-loaded travel speed of 26.7 mph. The model R-18 rear dump is equipped with a five-speed transmission, 16.00-25 drive tires, and hydraulic booster steering. The standard body carries 10½ yd and an 11 yd quarry-type body is also available.—**Euclid Div., General Motors Corp., Cleveland 17, Ohio.**



Dozing—But Never Dozing Off. Moving earth for new Interchange north of Washington, dozers average 3000-4000 hrs. before overhaul using Cities Service C-300 Motor Oil!

Greene in Name Only. Veteran construction man Ralph Greene is one of Washington's largest earth movers. He refuses to baby his trucks. With Cities Service lubricants they can take it!

At work on new Interchange: Greene & Dyer, Inc., Washington, D. C.

Trucks go 7000 hrs. without overhaul—Shovel chalks up 8500 hrs.

Big earth mover strikes paydirt with Cities Service Products

In the past year, Greene & Dyer, Inc. has moved 1½ million yards of earth in building an Interchange for the new road system north of Washington, D. C.

To do it, President Ralph Greene has kept his trucks, dozers and shovels running constantly under grueling mud and dust conditions. For, as he says: "We're in business to move dirt, not to baby trucks."

Nevertheless, Greene's equipment is rolling up one record after another, using Cities Service C-300 Motor Oil and Cities Service fuels and greases.

Dozers are getting 3000-4000 hours before overhaul. Trucks are rolling up 65,000 miles—or about 7000 hours each. And one shovel has gone 8500 hours with no overhaul yet needed.

Says Greene: "That's proof enough for me that Cities Service products are the best I can use. I'd recommend Cities Service to anyone whose work demands fuels and lubricants that can take it."

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

THE BEST SAW OPERATORS REACH FOR THE BEST BLADES

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TAKE THIS CD-7245-3...

It's a New Clipper Bond with a full 3/16" Diamond Depth—that will positively out-cut, out-last and out-perform ANY BLADE ever developed, to cut all HEAVY and LIGHTWEIGHT BLOCK, STONE and BASIC REFRACTORIES. Here's a Long-Life Blade that will give you real performance! Call your Clipper Factory Trained Representative for a performance test on your job or for Same Day Shipment from your nearby Clipper Branch Warehouse.

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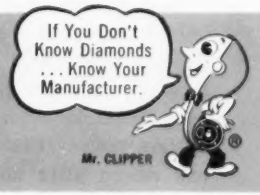


looking for

BIG TONNAGES

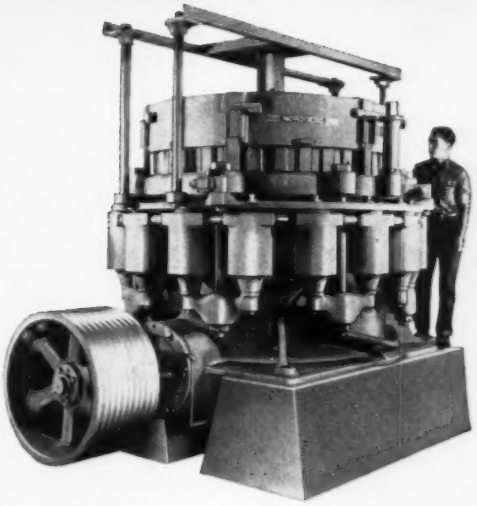
of finely crushed product?

. . . then you need the Gyradisc® CRUSHER

HERE *you see a handful of specification sand made by the Gyradisc Crusher . . . from a Pea Gravel feed, previously considered a "costly, difficult material to crush."*

This is but one example of what producers may expect of the Gyradisc Crusher . . . but more important, the Gyradisc in most cases substantially reduces the cost of producing a finely crushed product . . . such as manufactured sand or other specification material from a minus ¾" feed of crushed stone or Pea Gravel.

The Gyradisc Crusher is designed specifically for the low cost, large volume production of fines. If you are faced with a critical shortage of fine material, want to expand your market or want a profitable solution to the problem of handling and disposing of excessive Pea Gravel or other unsaleable material . . . it will pay you to investigate the Gyradisc. It has benefited other operators and may help you. *Nordberg Mfg. Co., Milwaukee, Wisconsin.*



Built to supplement the Symons® Cone Crusher, the 54" Gyradisc Crusher is providing volume production of still finer specification material. It is currently being used for the production of many materials such as agricultural limestone, limestone chips, sand, rock dust, crushed stone for asphalt mix and the fine reduction of asbestos and talc. *Write for Bulletin 228.*

SYMONS . . . *A Registered Nordberg Trademark Known Throughout the World.*

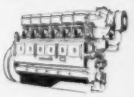
Enter 57 on card, page 101

Symons Gyratory and Cone Crushers

Nordberg Grinding Mills

Symons Vibrating Grizzlies and Screens

Nordberg Engines . 10 to over 12,000 hp.



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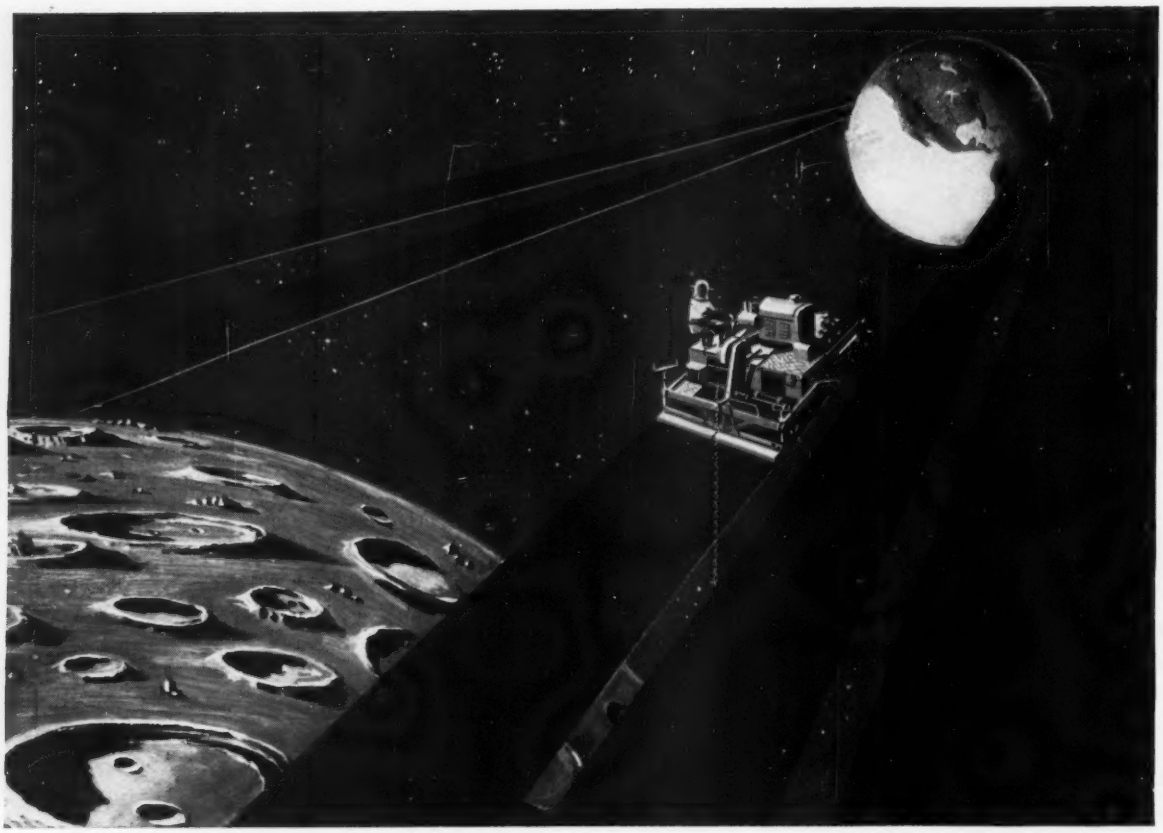
C-257



The 5th (s)trip to the moon has been started

By conservative estimates, the thousands of Barber-Greene Finishers throughout the world have started paving their second million miles. That is the equivalent of more than four trips to the moon. The current design of the Model 879-B is based on that experience.

Improving the Barber-Greene Finisher is not new. Scores of major improvements have been embodied in its design since it was first released to the field 20 years ago. Each engineering advance is backed by experiences in laying every type of mix in virtually all conditions.

Latest improvements include:

New transmission — increases both operation and travel speeds, still provides 12 forward speeds for a wider range of operation.

Higher speed tamper — permits faster laying speeds and reduces maintenance costs.

New crawlers — precision-drilled pads and larger pins further decrease maintenance costs.

New power unit — 20% more power for pushing bigger trucks up steeper grades, with a greater reserve for high altitude and higher operating speeds.

Note to Barber-Greene Finisher Owners: *You can have any and all of these improvements on your machine. Necessary parts are available in kit form for each separate modification. Write for the folder describing the various kits.*

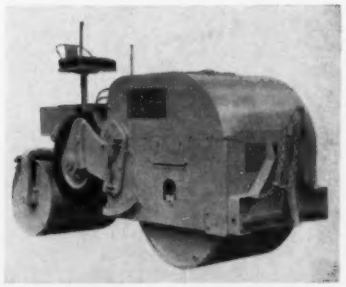
57-5-F

Barber-Greene BG

AURORA, ILLINOIS, U.S.A.

CONVEYORS . . . LOADERS . . . DITCHERS . . . ASPHALT PAVING EQUIPMENT

EQUIPMENT NEWS...
continued



FOLD-AWAY WHEELS—A new 4-6-ton tandem roller with built-in wheels that fold out of the way when not in use has been introduced by Buffalo-Springfield. After the roller has been hauled to a job, the towing wheels are raised hydraulically and folded into the sides of the main frame. This eliminates the usual overhang of transportation wheels and allows the operator to get closer to obstructions with his rolls because the overall width of the machine is substantially reduced. Operator visibility is also increased. The new roller, called the KT-8, has torque converter drive that automatically matches power to variations in grades and materials. Speeds vary from .5 to 5.3 mph. The roller has one hydraulic system that utilizes two pumping circuits to provide pressure for raising and lowering the towing wheels and for the power steering system. The same system also supplies fluid for the torque converter and lubricates the transmission. The 3-5-ton KT-7A is another new Buffalo-Springfield roller. This unit has many of the features of the KT-8 but it does not include the hydraulically operated towing wheel arrangement. — **Buffalo-Springfield Roller Co., Div. of Koehring Co., Springfield, O.**

CHECKS WATER—A new device called **the Water-larm** is said to warn the operator of a diesel-powered rig when water is low long before the engine registers a heat build-up. The instrument works whether the motor is on or off, according to the manufacturer, and it also registers a warning if water is lost through a broken hose. The device is installed in the coolant system. When water drops to the level selected at the time of installation, the unit sucks air and this switches on a

continued on page 222

THE CASE OF THE NARROW CONCRETE FORMS

Vibrating concrete in narrow forms has long been a problem to manufacturers of precast concrete products. The revolutionary new Power Midget vibrator produced by STOW Manufacturing has solved this problem. With a head only 1¼" in diameter this vibrator can work in the narrowest forms. It really packs a wallop too, powered by a ½ HP Universal Motor with trigger switch, the head is driven at 12,000 VPM.

The Power Midget has been thoroughly field tested and is ideal for precast work, perfect for any job where narrow forms are required such as bank vaults, manholes, etc.

A Complete Line of Concrete Construction Equipment.

Vibrating Screeds

Grinders

Roto-Trowels

Vibrators

STOW

Manufacturing Co.
31 Shear Street
Binghamton, New York

MAIL THIS COUPON *TODAY!*

Stow Manufacturing Co. 31 Shear Street
Binghamton, New York

I'm interested in the Stow Line of Concrete Construction Equipment. Send a complete catalog and name of nearest distributor.

I am particularly interested in_____

Name_____ Title_____

Company_____

Street_____

City_____ State_____

How to save time pouring concrete under a low ceiling

Tennessee contractor solves clearance problem

Pouring a concrete floor, 80 by 180 feet, may be just an ordinary job—but *not* when it must be done with a ceiling only 10 feet above you. Yet that was the problem Oman Construction Company of Nashville, Tennessee, faced recently—and licked! First floor and basement columns of the American Bread Company building, Nashville, had been poured and in use for several years; the Oman contract included pouring a 6-inch basement floor slab and building curtain walls.

Other machinery too big or too slow

Before starting the job, management carefully considered the equipment on hand. Usual mixers and other machines measured too big for basement use. Wheelbarrows or "Georgia buggies" were sure to be too slow and costly. But there *was* one piece of equipment that *might* do the trick. They called the firm's mobile Michigan Tractor Shovel in from loading work, and tried it out.

Michigan "extremely maneuverable" between columns

In its test, the Michigan Model 175A received a full bucket load of ready-mix from a transit mixer. With bucket "cradled" in normal low shock-resistant carry position, down the ramp it went into the building's basement. Less than 8 feet high, the Michigan easily cleared the first-floor beams overhead. Load was poured out quickly, carefully—and back out of the basement the Michigan went for another 2¼ yards (struck measure). Operator Chester Chambers reported the power-steered, power-shifted Michigan extremely

(Advertisement)

Michigan Tractor Shovel owned by Oman Construction Company, receives load of ready-mix direct from transit mixer of T. L. Herbert & Company, Nashville. Bucket holds 2¼ cubic yards struck, 2¾ cubic yards heaped, SAE measure.

maneuverable among the many supporting columns, also found he could get into (and out of) the tightest places easily. From then on, it was Michigan all the way.

Rough-spreads concrete, too

It wasn't long before the job foreman, Frank Rutledge, discovered Michigan could do a good job of rough-spreading the ready-mix, too. Simply by lowering the bucket, holding it under pressure and dragging backwards, Operator Chambers left the surface ready for the finishing crew. Finger-tip bucket control and unusual maneuverability made this time-consuming job a cinch, dispensed with many of the laborers ordinarily needed.

Maybe Michigan could solve YOUR problem-job

Everyone gets a "problem-job" from time to time. Maybe *you* have one *now*. If it involves loading or carrying bulk material, we'll wager a Michigan can do it quickly, efficiently, at a minimum cost. But, see for yourself! Won't cost you a penny. Just call your Michigan Distributor, ask him to arrange a demonstration. *You pick the job.* We'll *also* wager that, once you see a Michigan Tractor Shovel in action, you'll spot a score of jobs in which you'd like to use it. And why not? With Clark's popular Lease-Purchase Plan, you can put a Michigan to work without laying out a cent of capital. Eight basic models, 36 different buckets and attachments to handle anything you've got!

Michigan Model 175A dumps, then rough-spreads each load to save finishing time. Machine was sold to Oman by Dempster Brothers, Inc., Michigan Distributor in eastern Tennessee.

Another contractor finds Michigan ideal for pouring concrete in cramped quarters

Slattery Rock Corporation, Maspeth, Long Island, used the same technique as did Oman to lay 6 lanes of New York's Deegan Expressway under low viaduct. Michigan Tractor Shovels did all the concrete hauling. Two of these maneuverable rigs needed only 4 hours, 200 to 250 trips, to pour 800 feet of each 12-foot lane.

CLARK® EQUIPMENT

Michigan is a registered trade-mark of
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HOW TO HANDLE
WET JOBS

ONE LIFT REMOVES
18 FT OF WATER FROM
"PATCH-QUILT" SOIL

Sewage treatment plant, Clayton, N. J.
Contractor: C & T Affiliates, Inc.

SOIL on this job varied by area—fine silty sand here—coarse sand there—gravel a few feet away. This "patch-quilt" pattern precluded routine handling.

GRIFFIN engineers carefully planned proper installation for each wellpoint, using sand filters on some but not others.

This plus other special methods lowered the 18 ft of water with a money-saving single-stage wellpoint system. Top photo shows system placed directly at water level.

GRIFFIN
WELLPOINT CORP.
881 East 141st Street, New York 54, N. Y.
Hammond, Ind. Houston, Tex. Jacksonville, Fla.
In Canada: Construction Equipment Co., Ltd.
Toronto Montreal Halifax

EQUIPMENT NEWS . . .

continued from page 219

red warning light on the vehicle dashboard. To resist corrosion, the device is made of brass, aluminum, and stainless steel. — **Water-larm Corp., 404 S.E. 202 St., Portland, Ore.**

WHEELS ON GROUND—Trailmobile's new frameless dump trailer has the body hinged at the rear of the tandem frame, thus permitting all wheels to remain on the ground when the body is in the elevated position. With the new Trailmobile design, the trailer frame is an integral part of the body. This reduces weight and permits greatly increased payloads. Overall width of the new trailer is 95½ in. and inside lengths range from 21 to 32 ft. Because the body is hinged at the rear of the tandem frame, a floor height of 43½ in. is maintained, even when the trailer is in the fully elevated position. — **Trailmobile, Inc., 31st & Robertson Ave., Cincinnati 9, O.**

INCREASES LINE — American Road Equipment Co. has added the Hopmobile motorized cart to its line, which features the Econmobile materials handling vehicle. The Hopmobile, which is powered by a Continental 2.85-hp engine, has a payload capacity of 1,500 lb. Fingertip control of the cart is provided by a ballbearing clutch. The unit can be maneuvered in close quarters by rotating the single rear drive wheel. The standard machine comes with hydraulically powered fork

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Need to move heavy equipment in a hurry? Here's the way . . .

Expressway Contractor Relies on New Michigan

With around 85 men on their 1½-mile four-lane North Glade Expressway paving job every day . . . with 40 batch trucks and dozens of pieces of specialized road-building machinery to keep busy . . . Carl Goodwin & Sons, Allegan, Michigan, has a major coordinating task . . . and that's where their new Michigan 25-ton excavator crane comes in!

Moves cement finishing machines

Putting in pavement at intersecting streets is an important—but costly—part of the 70,000 square yard contract. To save money, cement finishing machines must be moved with as little lost time as possible! One man in the Michigan picks up these bulky rigs, moves them quickly to the next section site. No need to load heavy equipment on a trailer for these short hauls—the Michigan can transport it alone!

Michigan lifts and carries 14-ton sub-graders

To make best use of heavy subgraders, they too must be moved—fast! Operator Dale Anson says: "The Michigan has plenty of lifting power—well beyond the weight of anything we've yet had to move. Besides the subgraders—which weigh about 14 tons—I also lift and carry bull floats, spreaders and finishing machines. I particularly like Michigan's worm-gear boom hoist, with power up *and* down. It lets me ease loads in very precisely."

Goes everywhere without permit

"The new Michigan has done a good job!" reports Supt. Cal Harris. "Our operator says it's easier to handle than any other crane. It does a fine job pulling and resetting forms, and breaking old pavement with a skull-cracker. It goes everywhere . . . over all kinds of roads . . . without special permit!"

Let us show you how Michigan versatility and mobility can pay off for *you!*

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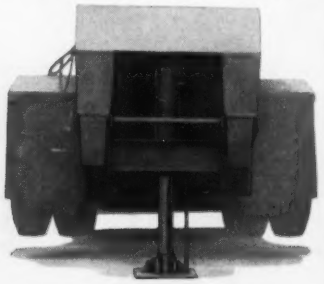
THPG HYDRAU-LIFT
Detachable Gooseneck

TRAILER



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The new HYDRAU-LIFT Detachable Gooseneck by Rogers—the pioneer builders, provides fast, dependable, versatile performance not available in any other trailer.

Ability to detach, load the trailer and reattach the gooseneck is an outstanding feature. Man-saving simplicity of control, is greatly appreciated. Other valuable, exclusive features are incorporated.

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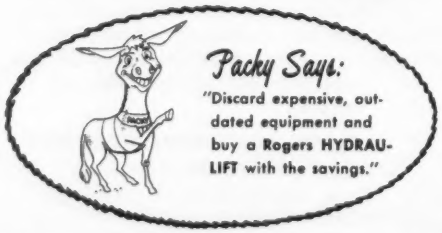

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EQUIPMENT NEWS ...

continued

lifts. The removable hopper, pictured, also has fingertip control for dumping. It is available as an attachment. — **American Road Equipment Co., Omaha, Neb.**

WIDER PICK-UPS—Three new pick-up trucks featuring wider cargo boxes that offer greater payload space have been offered by Chevrolet. Called Fleetsides, the new trucks are available in the ½-ton series with either 6½ or 8-ft box lengths and a choice of wheelbases. A ¾-ton model is available with an 8-ft long box. Both have an inside width of 6¼ ft, an increase of more than 2 ft over previous Chevrolet pick-ups. Both bodies are 19⅛-in. deep. Capacity of the 6½ ft body is 59½ cu ft, and the 8-ft body has a capacity of 75⅝ ft. Floors of the new truck bodies are made of seasoned hardwood with flush-type steel skid strips. Increased rigidity is said to result from the use of integral fenders in the side panels and from flanged wheel-housings that bolt to the floor. Bolt-on steel upper and lower side panels overlap to give double wall protection to the lower half of the box to minimize deflection from load.—**Chevrolet Motor Div., General Motors Corp., General Motors Bldg., Detroit 2, Mich.**

VERSATILE GUN—Three quickly-interchangeable barrels enable the powder-actuated Ammo studgun to handle a wide range

A frequently-seen Michigan Tractor Dozer application: leveling fill. The job: enlarging the Oakland (Calif.) airport.

Be sure to check before you buy

which dozer gives you the most

SPEED . . . Michigan rubber-tire Tractor Dozers have a top of 28 mph forward, 28 mph reverse.

TRACTION . . . of all rubber-tire dozers, only Michigan has full traction when turning. You *steer* around turns, don't wear out tires by dragging or braking inside wheels.

TRACTION IN SOFT GOING . . . of all rubber-tire dozers, only Michigan has a front-axle no-spin differential. Wheel on poorer footing automatically slows down; power goes to other wheel.

EFFICIENT POWER FLOW . . . of all tractors, only Michigan has a power train completely designed and built by one manufacturer (Clark). This power train design has been so effective it has been used without any basic change in the over 8,000 Michigan Tractor Shovels and Dozers now in the field.

EASY OPERATION . . . to change speed or direction of a Michigan, simply move small steering-post lever. No time or momentum lost for clutching. New operators easy to train.

VERSATILE BLADE . . . from seat, operator can pivot blade through 35 degree arc *under pressure* to uproot stumps, dig or float.

MECHANICAL EFFICIENCY . . . All Michigans have planetary wheel axles which reduce axle strains 70% . . . 3-to-1 torque converters which eliminate shock loads . . . power-shift transmissions . . . simple job-proved hydraulic controls . . . thus stay on the job and out of your shop. *Ask any Michigan owner to compare its mechanical efficiency record with other tractors he has now, or has had.*

COMPLETE LINE . . . four models now available . . . 165, 262, 335 and 600 hp. Big wide-base tubeless tires, power-shift transmission, torque converter, planetary wheel axles, down-pressure blade, swinging drawbar standard on all models . . . to get top efficiency you need no "extras". Wide variety of purchase plans . . . including no-money-down, pay-as-you-profit lease-purchase.

Ask us for details before you buy *any* dozer. Rubber or tracks, we welcome your test and comparison.

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CLARK EQUIPMENT

Lima Austin-Western Model 101-S Plant, owned by C. W. Allen, Wilburton, Okla., producing gravel filter for Table Rock Dam on White River.

LIMA Austin-Western 101-S Plant Speeds Dam Project in Missouri

This high-capacity Model 101-S Plant is being used to produce gravel filter for the slope of Table Rock Dam, on White River, near Branson, Mo. Using riverbed gravel, the plant turns out an average of 100 cu. yds. per hr. of material ranging in size from 3 in. down to fine sand.

This portable crushing and screening plant sets a new high standard for high production and low maintenance. While intended primarily for gravel operation, it performs equally well in quarry service when combined with a portable primary. Standard equipment includes a 10 x 36-in. primary jaw crusher, a 30 x 20-in. roll crusher, 30-in. conveyors, and a 4 x 12-ft. inclined, positive-throw type vibrating screen. It may be had with either a shovel-loading hopper or a swivel drive for feed conveyor. It is a completely self-contained unit that can be transported over most highways without special permit.

Make your next crushing and screening plant a Lima Austin-Western for all-around economy and greater returns on the investment. Call on your nearest distributor for full information. Or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

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4824

of fasteners and pins. The new tool reduces fastening costs, according to the manufacturer, because the operator can always select the most economical cartridge-pin combination for each job. The compact, lightweight gun is designed to minimize noise and tc facilitate loading and servicing. A hemispherical safety guard traps dust and helps to keep the nose level low, and a special gas expansion chamber cuts cleaning time. Various safety devices are built in to the gun, including a guard that prevents the gun from firing unless it is in position and firmly pressed against the work surface. The tool meets accident commission safety requirements in all states. — **Ammo Products, Inc., 1100 20th St., N.W., Washington, D.C.**

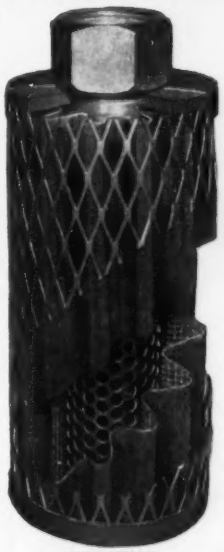
PORTABLE BATCHER — The Johnson Tumbleweed portable batcher for charging transit mix trucks is available in 3½ and 5-yd capacities. The unit can handle from 25 to 40 yd per hr, depending upon the hopper size and the width of the discharge belt conveyor. Eighteen and 24-in. wide belts are available. The steel hopper is open for charging on three sides. It has 60-deg side slopes and double clam gates for fast, clean discharge onto the belt conveyor. A 24-in. dia weighing scale that can be rotated for visibility from any direction is standard. Other features include an all-welded frame, a built-in axle and towing assembly, and an optional built-in water meter and 1½ in. piping to the charging point of transit mix trucks.—**C. S. Johnson Co., Champaign, Ill.**

SAFETY FACTOR—An independent brake control group is available for the Caterpillar DW20 tractor. Designed for use with either wagons or scrapers, the attachment allows the operator to engage the brakes of the trailed unit only. It works independently of the standard tractor brakes, and serves as an anti-jackknifing device when operating on hazar-

Photo courtesy of Pettibone Mulliken Corp., Chicago, Ill.

MARVEL Synclinal FILTERS

are Standard Equipment Pettibone "SPEED SWING" 180 Degree Swing Loaders



SUMP TYPE (cutaway)

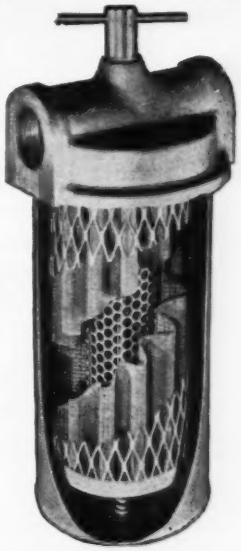
MR. A. T. LOGUS, Chief Engineer of Pettibone Mulliken Corp. expresses preference for Marvel Synclinal Filters as follows—

(A) "The ratio of the total filtering net area to the net area of the inlet pipe is much higher than any other oil filter on the market.

(B) The direct result of the high area ratio is lower hydraulic pressure drop over pro onged operating periods.

(C) All materials used in manufacturing the Marvel Filters are impervious to corrosive action from the additives and other elements contained in oil.

I might add that the price of these filters is lower than some makes of oil filters that are much less des rable on the basis of the above three points."



LINE TYPE (cutaway)

OVER 800 Original Equipment Manufacturers

of stationary or mobile equipment utilizing hydraulic or other low pressure liquid circulating systems are installing Marvel Synclinal Filters as Standard Equipment.

A SIZE FOR EVERY NEED

Available for sump or live installation in capacities from 5 to 100 G.P.M. Greater capacities may be attained by multiple installation (as described in catalog). Choice of monel mesh sizes range from coarse 30 to fine 200.

EASY TO CLEAN

Both sump and line types are easily disassembled, thoroughly cleaned and reassembled, on the spot, in a matter of minutes. Line type operates in any position and may be serviced without disturbing pipe connections.

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Catalogs contain dimensional charts and complete engineering data making it easy to order a filter for your specific requirements and get Immediate Delivery.

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- ☐ Catalog #200—For Fire-resistant Hydraulic Fluids (Aqueous Base)
- ☐ Catalog #400—For Fire-resistant Hydraulic Fluids (Synthetic)
- ☐ Catalog #301—For Water

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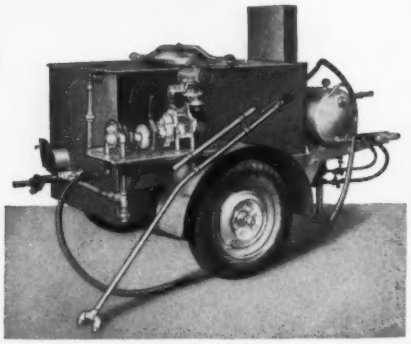

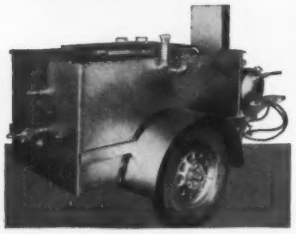

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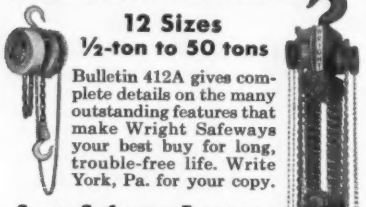

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Load and Idler Sheaves rotate on life-lubricated, antifriction bearings... minimum of 5 pockets in Big Sheaves for efficiency and long life.

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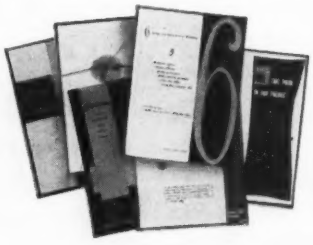

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EQUIPMENT NEWS...

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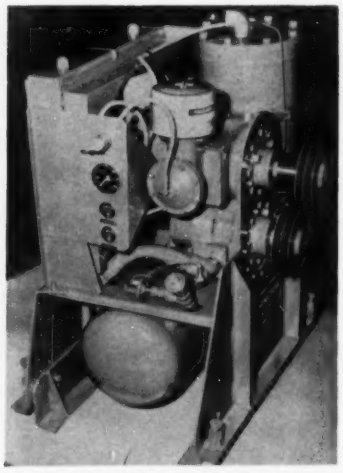
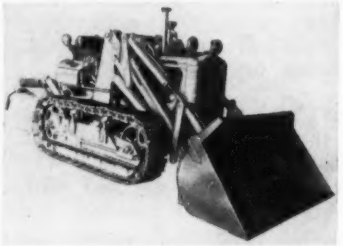
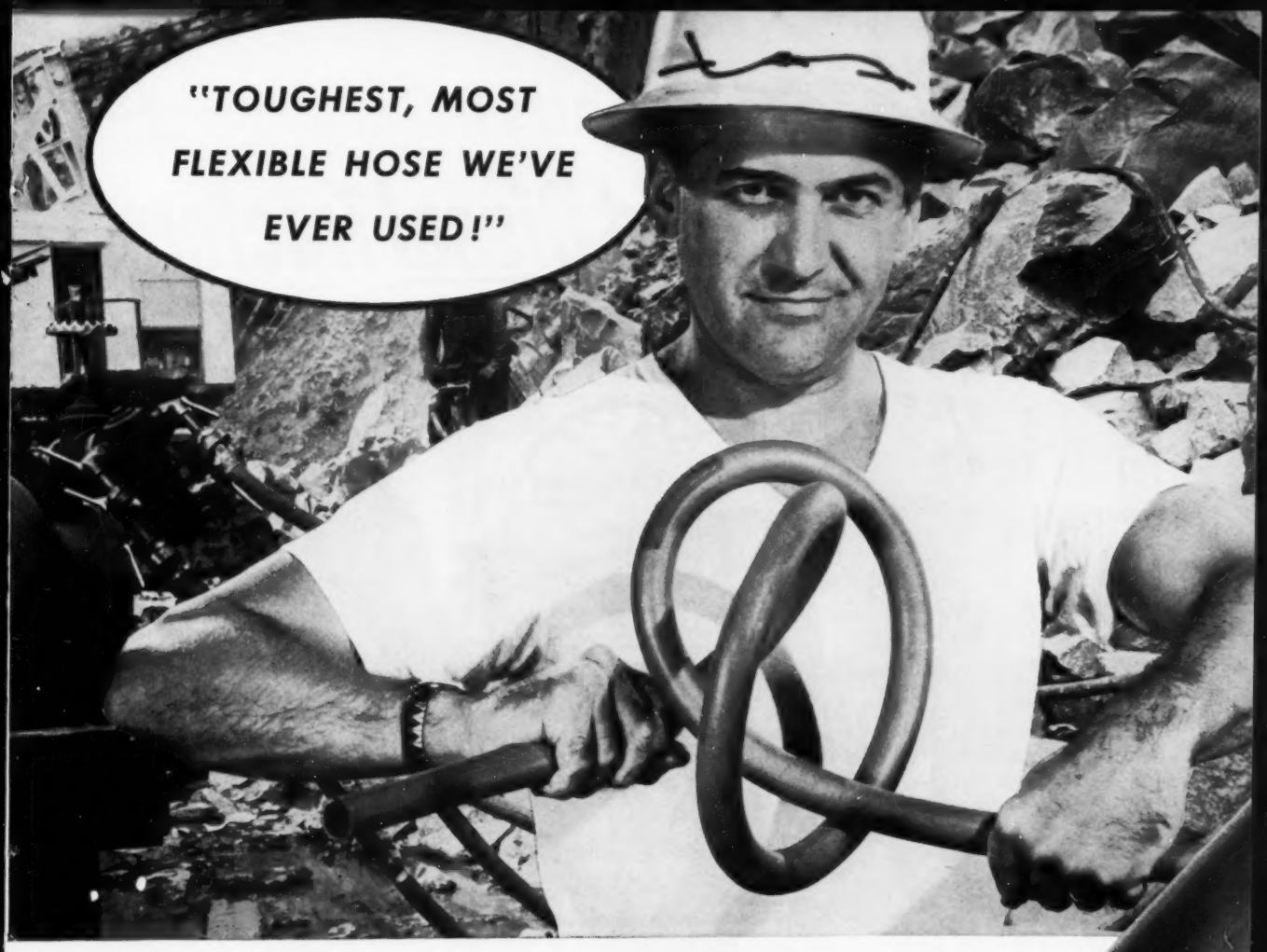
dous underfooting. The control group consists of a two-position hand operated air valve and the air circuit. The hand valve is mounted conveniently on the steering column. The attachment can be installed in the field or on new machines at the factory.— **Caterpillar Tractor Co., Peoria, Ill.**



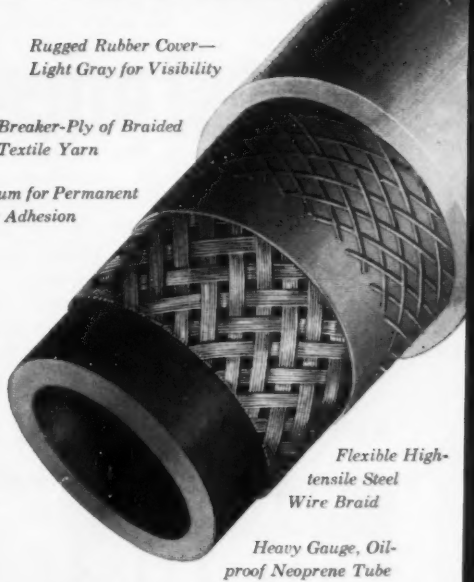
SAVES SPACE—Sold as a packaged unit, Worthington's new 125-ft rotary compressor fits snugly in the back of a truck as it is driven through a power take-off by the truck engine. The complete unit, which is only 38 in. long, 28 in. wide, and 39 in. high, consists of a two-stage, rotary compressor, speed control, engine governor, oil cooler, air receiver, oil separator, and oil storage receiver. All components are mounted on a common base plate. The unit is belt-driven through a split power take-off and controlled by the driver from the truck cab. — **Worthington Corp., Holyoke, Mass.**



VERSATILITY INCREASED—The Oliver Corp., which in 1958 will produce the broadest line of construction equipment in its his-



THUNDERBIRD WIRE BRAID AIR HOSE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Available in sizes from $\frac{3}{8}''$ to 4". Working pressures up to 400 psi air, or 2,000 psi water. Get the facts now from your Thermoid Distributor, or write direct.

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NEW Ford Diesel Tractors

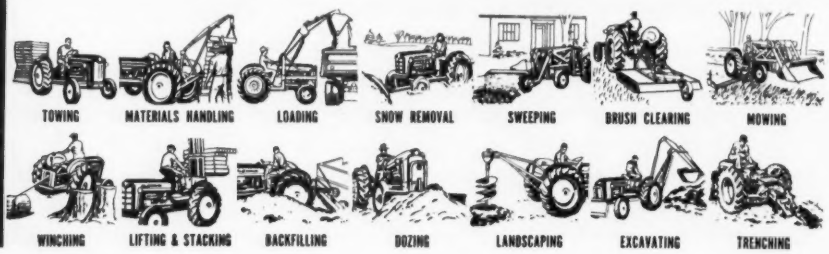
Lowest priced diesels in their class!

Now from Ford—traditional leader in the industrial field—comes a new line of diesel tractors which will combine greater operating economies through thrifty diesel power with all the time-tested performance features of Ford's gasoline tractors! Four great new models ranging from a Special Utility Model through fully equipped models with choice of four or five speed transmissions, or an auxiliary transmission giving 12-speed mobility, and standard or "live" power take-off. All front and rear-mounted loaders, blades and other attachments fit both gasoline and diesel models of the new Ford tractor line for 1958. Get all the facts on these new Ford Diesel Tractors from your nearby dealer, or write to Tractor and Implement Division, Ford Motor Company, Birmingham, Michigan.

Now! Many Ford tractor models with gasoline, LP-gas and diesel engines

YOU SEE MORE FORDS BECAUSE THEY SAVE MORE MONEY!

HANDLE ALL THESE JOBS AND MANY MORE...AT LESS COST!



tory, has made available several new attachments for its crawlers. The 28-hp OC-4 is available with a new trencher as well as several other work tools, including a hydraulic side boom for pipeline work. In the 62-hp range, Oliver's OC-12 can now be fitted with a rear-mounted scarifier (photo), and the OC-126 loader has a new angleblade that mounts on the loader arms. The 110-hp OC-15 crawler is now available with a new, fully hydraulic 2½-yd loader. New features for the Oliver OC-18 include a cable-operated angleblade and dozer. The biggest change in Oliver's rubber-tired tractor line is the introduction of a torque converter and Reverse-o-matic drive for its Super 77.—**The Oliver Corp., Industrial Div., 19300 Euclid Ave., Cleveland 17, O.**

CLEANS FORMS—A portable engine-driven form cleaner has been developed by Economy Forms Corp. Called the EFCO form cleaner, the machine works on any panel form up to 30 in. in width. Forms are simply loaded on the machine's conveyor belt and it pulls them under a rapidly rotating steel wire brush. The forms are automatically oiled and ready for re-use when they leave the far end of the conveyor belt. The machine is geared to clean forms at the rate of 42 lineal ft per min. The cleaner is mounted on a trailer that has a standard ball hitch and retractable support leg so that it can be hauled by a car from job to job and moved by hand from one stack of forms to another. Power is supplied by an 18-hp Wisconsin air-cooled gasoline engine. Rotary cleaning brushes, 12 in. in dia, rotate at 1700 rpm. — **Economy Forms Corp,. 4301 N.E. 14th St., Des Moines, Iowa.**

continued on page 232

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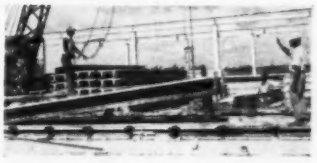
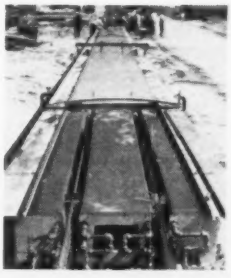
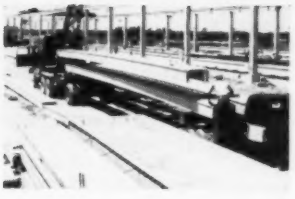
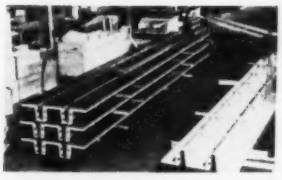
DOUBLE T
FORM-CRETE
STEEL FORM









From forming to final assembly FORM-CRETE units are precision manufactured. During assembly special engineered jigs hold parts in true, straight alignment. Finished forms are inspected, checked and then carefully packed for fast delivery to your plant.

Most versatile and advanced contribution ever developed in the techniques of mass producing prestressed and reinforced concrete! This Double T FORM-CRETE form assembly offers the concrete manufacturer a great opportunity to expand and diversify at minimum initial cost—with a maximum selection of products to cast! Roof slabs, channels, bleacher seats . . . double T joists . . . single T joists with assorted combinations of ends, offsets, and cantilever overhangs—plus many other shapes—are available by utilizing a variety of grout forms and stem heights. An ingenious manufacturer can easily surpass the 37 individual castings we have conservatively estimated available from this one all-steel Double T FORM-CRETE form.

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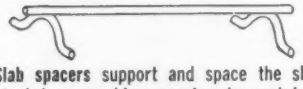
How to Space Reinforcing Steel in Concrete

Sure-Grip accessories help you do a better job of spacing reinforcing steel in concrete because they position the steel exactly where you want it. You eliminate make-shift supports and save time, material and labor.

Slab bolsters support the slab steel. Corrugations are 1" on centers and serve as a guide for the steel setter. Available in heights up to 2" and in 10' lengths. Slab bolster upper and slab bolster with plate are also available.



Slab spacers support and space the slab steel. Legs provide support under each bar. Fabricated to your specifications.

Beam bolsters support the bars from the soffit form in beams. Legs spaced 2" on centers. Heights up to 3". Stocked in 5' lengths. Also available with two longitudinal wires along legs for use in upper layers of steel.

High chairs support steel in upper layers of slab. Stocked in heights from 2" to 6½" with ¼" graduations. Can be used as a screed chair. Special high chairs have cross wires welded to legs for setting on lower layer of bars.

Continuous high chairs support upper slab steel and eliminate carrier bars required with individual supports. Legs are 12" on centers. Fabricated to your specifications.

Bar chairs support miscellaneous steel in the slab. Stocked in ¾", 1" and 1½" heights.

FREE — Mail the coupon below for 48 page illustrated catalog of concrete accessories and name of your nearest Sure-Grip dealer.

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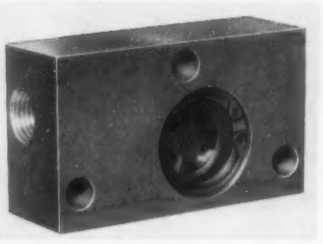
EQUIPMENT NEWS . . .

continued from page 231



TROUBLE SAVER — A simple visual indicator is said to save filters and to cut down on engine repairs by keeping tabs on the condition of the filter elements in an oil hydraulic system. Called the Spindicator, the unit shows the operator at a glance when an oil filter is dirty or not functioning. This is determined by a spinner that is mounted behind a window in the Spindicator. It revolves only when the filter element is clogged and needs cleaning or changing. The unit, which is only 3 in. long, 1¾ in. wide, and 1¼ in. thick, is easily installed. It is connected in parallel with the line filter and only small standard fittings and piping are needed. The unit operates in any position, and it can be located away from the filter if desired.— **Schroeder Bros. Corp., McKees Rocks, Pa.**

13-IN. EXPANSION JOINT—A new rubber expansion joint that allows up to 3 in. of contraction or expansion in highways or runways while the rubber keeps flush with the surface has been developed by B. F. Goodrich. Originally developed for the new prestressed concrete highways, the rubber expansion joint is also being designed for use on bridges and bridge approaches. Anchored between road sections for a water-tight seal, the joint is about 13 in. wide. It extends the width of the highway and fills the joint

LOWEST PRICED BIG DITCHER ON THE MARKET!

VERMEER 524T

Pow-R-Ditcher

Acclaimed by contractors everywhere, the 524T delivers more ditch at a much lower dollar cost. This rugged, quality-built unit is especially designed for wide foundation footings, gas, water and sewage lines. Digs 8" to 24" wide at speeds up to 15' per minute. Handles most ditch-digging jobs at a fraction of the cost of larger, more expensive trenching and ditching machines.

Model 4T Pow-R-Ditcher

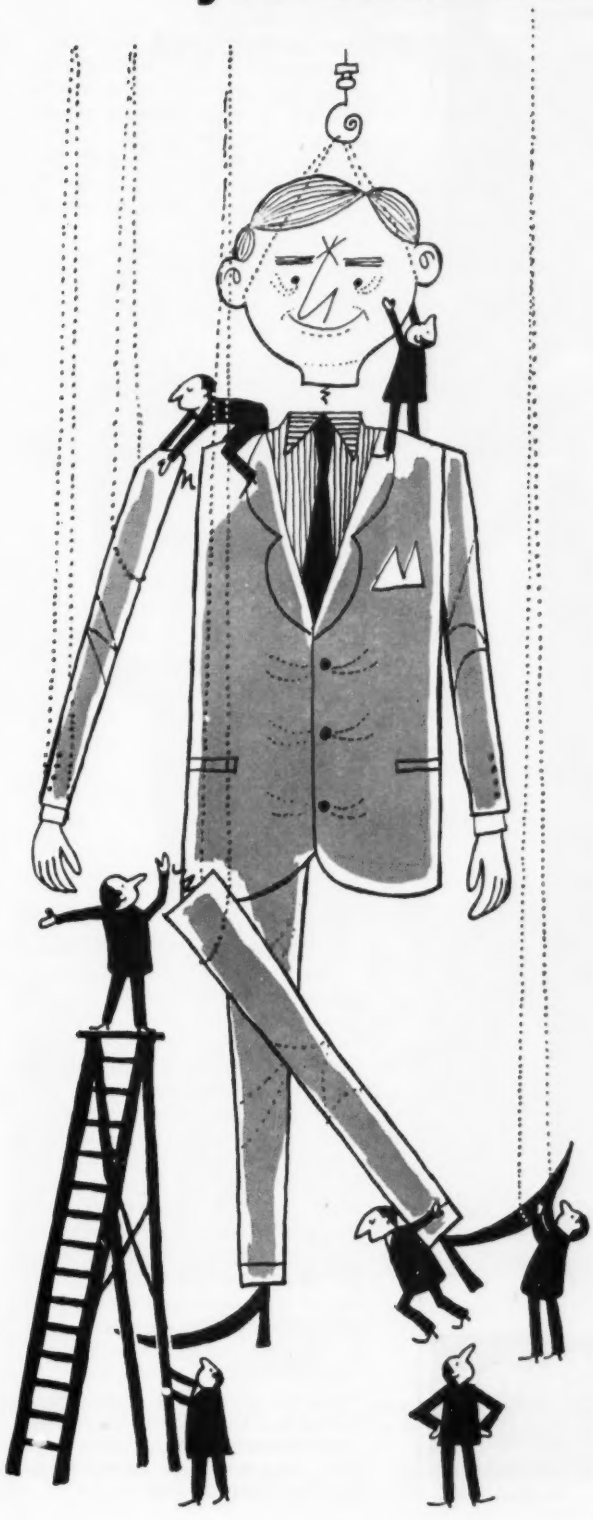
Has same size moving parts as the 524T but digs smaller 6" to 14" ditch. Ideal for the light construction field.

Write For Literature and Low Prices on the Complete Vermeer Pow-R-Ditcher Line

Another smaller Pow-R-Ditcher also available. Visit your Vermeer dealer for a demonstration or write for all the facts. Check the Pow-R-Ditcher before you buy. You'll like the quality AND THE PRICE!

VERMEER MANUFACTURING CO.
1435 W. WASHINGTON • PELLA, IOWA

Managers aren't born you make them!



Potential business leaders, like star ballplayers, may come into this world with the ingredients and instincts for success. But some understanding soul has got to sweat over them, and train them.

Today, the management manpower shortage is critical. And of all the responsibilities that rest on your busy shoulders right now, none is more crucial than the success of your company's own "Management Development Program".

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Management training must be continuous and progressive. It must be personal to the individual and his self-interests. It must be a pleasure, not a chore. It must be "adult", not teacher lecturing to pupil – but men of equal intellectual stature sharing subjects and problems of common concern.

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STOPS

fastener in its jaws!

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ONLY IN EMERGENCIES DOES THIS HAPPEN— — —

Unexpected soft spots in construction material hold no hazard for FLITE-CHEK. This new RAMSET® tool stops the fastener before it leaves the tool—prevents accidental escape!

Load and fire fast: no screwing or unscrewing of stud or piston either before or after firing—a double saving in time! Interceptor jaws work automatically. No delay or inconvenience.

Do an 8-hour job in 32 minutes with RAMSET FASTENING SYSTEM—the *engineered* method of fastening to steel and concrete. A squeeze of the trigger does tedious jobs instantly!

Now RAMSET, traditionally the safest powder-actuated fastening tool made, **is again first with the best**... safer than ever for work in concrete and steel.

Call your dealer for a FLITE-CHEK demonstration today. He's listed under "Tools" in the yellow pages. See the complete RAMSET-SHURE-SET® line of fastening tools.

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Ramset Fastening System

WINCHESTER-WESTERN DIVISION

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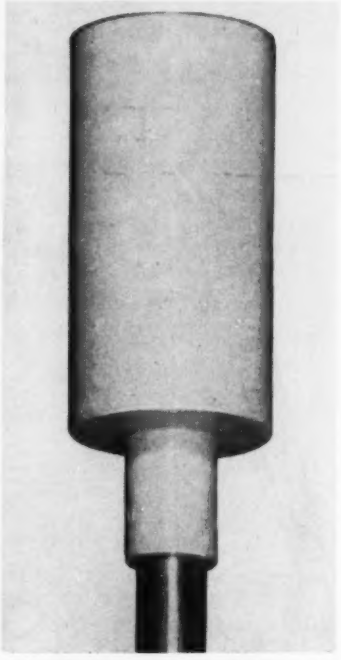
EQUIPMENT NEWS...

continued

connection to the required depth. It is said to eliminate the rhythmic road shock motorists generally encounter on highways. The joint is constructed of a man-made rubber that is especially compounded to absorb movement of the highway in cold or warm weather. A series of metal plates are bonded to the rubber to carry the vertical loads imposed on the joint by traffic.—**B. F. Goodrich Industrial Products Co., Akron, O.**



TAMPS BETTER — Lightweight poles that permit faster tamping of explosives in both horizontal and vertical blast holes have been announced by the Austin Powder Co. Because the poles are constructed of aluminum pipe, they weigh about half as much as ordinary wooden poles. In addition they will not warp or splinter and they are guaranteed not to spark. A feature of the new tamping poles is a hook and eye arrangement for adding lengths. This is done by passing the hook from the extension pole through the eye of the upper end of the lead pole. The resulting union is said to be strong enough to withstand leverage without slipping or breaking free. The poles come with 1⅝ 4½, or 5-in. dia rubber head blocks. Lengths from 4 to 20 ft are available.—**Austin Powder Co., Cleveland 13, O.**

For fast, low cost liquid asphalt deliveries . . .

NEW DESIGN

Butler asphalt transports

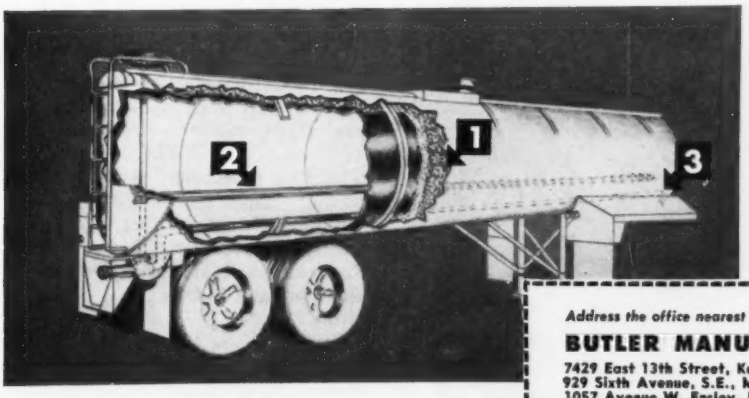
New design 6075-gallon Butler Asphalt Transport for use in Illinois. Butler has made asphalt transports as large as 6500 gallons for areas with high gross weight limits.

Here's an all-new asphalt transport that gives important savings in time and money to operators of asphalt plants and road contractors alike!

NEW payload power—A new design by Butler, manufacturer of a complete line of high capacity liquid transports, makes this transport as much as 3,000 lbs. lighter than most units only three years old. This means hundreds of gallons more legal payload per haul, fewer miles to drive to make deliveries, less investment in extra rigs.

NEW handling ease—Handling and backing are easier because of the new round shape of the tank which gives better visibility to the rear.

NEW low-maintenance construction — Maintenance, cleaning and fast drainage are simplified by the clean bore design of the tank. Strengthening rings located *outside* the inner shell make the tank stronger, yet lighter. Glass fiber insulation covers the entire inner shell and maintains the asphalt at liquid temperatures during long hauls.



Optional Features to Fit Butler Asphalt Transports to Your Operations

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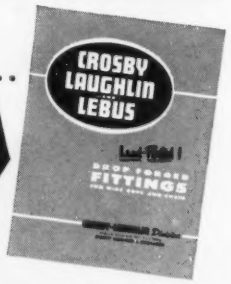


The world's most complete line of drop forged fittings for wire rope and chain

Detailed capacities, specifications and dimensional data are contained in this catalog listing over 2000 items. This complete data is directly transferable to your standards books.

For all lifting jobs "Load Rated" Fittings—featuring new alloys and a broader range of sizes—offer higher, guaranteed capacities with the safe working load permanently forged on every item. You're sure of getting *genuine* Crosby-Laughlin* Fittings because they're now painted RED—the color long identified with famous Crosby Clips and Blocks. Get this catalog that lets you order hooks, shackles, other fittings the *safe way—by capacity*, from mill supply, industrial or construction equipment distributors—or write direct to: *Trademark

CROSBY-LAUGHLIN *Division*
American Hoist and Derrick Company
FT. WAYNE 1, INDIANA

(Advertisement)

A busy New York City street was treated to the sight of huge 12-ton pile hammers pounding away at 1,600 H-beam piles into "made" ground to provide foundations for the South Street Elevated Highway. The piles varied in length from 35 ft to more than 200 ft and the contractor, Fehlhaber Corporation, used S10 Single-Acting Pile Hammers, manufactured by McKiernan-Terry Corporation, 110A Richards Ave., Dover, New Jersey, to do the work.

New Publications

These catalogs and bulletins from manufacturers contain useful information about construction equipment and materials. To obtain a copy, write directly to the manufacturer at the address given.

Rust Protection—A 36-p protective coatings manual contains actual color chips of 102 coating materials for rust, heat, and chemical protection. The booklet has sections on surface preparation, use of primers, finish coatings, and special custom coatings.—**Form 257, Rust-Oleum Corp., 2799 Oakton St., Evanston, Ill.**

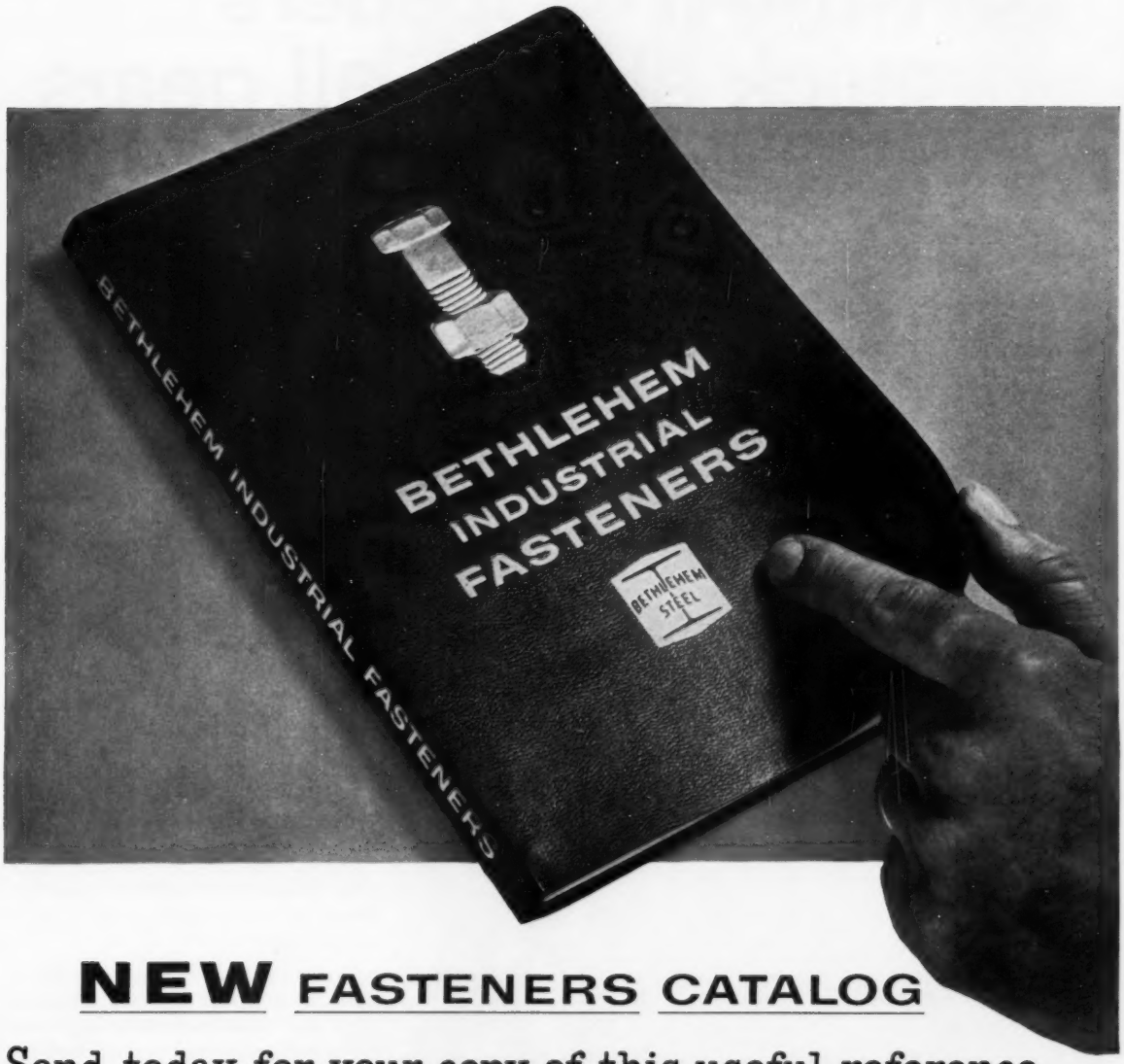
Timber Trusses—"Design and Use of Teco Trussed Rafters" explains the use of light wood rafter trusses for buildings. Included are specifications and material tables for 12 typical designs.—**Timber Engineering Co., 1319-18th St., N. W., Washington 6, D. C.**

Digging Gravel—Sauerman sand and gravel installations are described and illustrated in a new brochure SG-1. The booklet contains 10 job reports of dragscrapers, tower excavators, and slackline cableways used for high banks, long span pits, and deep digging under water.—**Sauerman Bros., Inc., 612 S. 28th Ave., Bellwood, Ill.**

Lumber Mill Data — More than 200 mills in Oregon, Washington, and California are listed in the 1958 edition of "Where to Buy." The 40-p directory lists key personnel, capacity, facilities, and timber products for each of the mills.—**West Coast Lumbermen's Association, 1410 S. W. Morrison St., Portland 5, Ore.**

Lift Trucks — A "cutaway" brochure describes the Yale Worksaver line of rider-walkie trucks. Using sectionalized views and die-cut pages, the booklet pictorially disassembles the Worksaver to show its operating features.—**Yale Materials Handling Division, Yale & Towne Mfg. Co., 11,000 Roosevelt Blvd., Philadelphia 15, Pa.**

continued on page 239



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Send today for your copy of this useful reference, the most complete edition ever issued!

Bethlehem has just issued "Industrial Fasteners," an illustrated catalog on headed and threaded fasteners. Handsomely bound, this 164-page catalog is attractively printed in two colors; and it is packed with data on just about every type and size of fastener imaginable. List prices, dimensions, weights, and container quantities are also included.

If you have not yet received your copy, use the accompanying coupon. Simply print your name and address, clip the coupon, and mail it direct to us at Bethlehem, Pa.

Publications Department, Room 1034
Bethlehem Steel Company
Bethlehem, Pa.

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A SIMPLE FLICK OF THE WRIST and your operator can quick shift at full throttle in all three forward and all three reverse speeds.

A shovel loader with TORQMATIC DRIVE can "crowd" a load and get a full scoop every time. The TORQMATIC converter multiplies engine torque more than 300%.

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Take a tip from 80 manufacturers of 122 different kinds of road-building and construction equipment. Get the Allison TORQMATIC story.

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NEW PUBLICATIONS . . .

continued from page 236

Cutting Concrete—A new Clipper brochure, No. 3006, covers diamond, break resistant, and abrasive blades for cutting masonry and concrete. A complete list of Clipper factory branch offices offering same day shipment is included. **— Clipper Mfg. Co., Suite 143, Kansas City 8, Mo.**

Concrete Tips — Highway Research Board Bulletin 162 is entitled "Concrete Pavement Construction and Winter Construction of Bridges." It covers new pavement jointing methods now in use in Michigan and the use of insulated forms for concrete bridges in winter construction. **—Price 60c, Highway Research Board, 2101 Constitution, Washington, D. C.**

Safety Program—A 16-p booklet covers job safety programs for construction projects, including safety committees, training new employees, medical arrangements, reporting accidents, fire precautions, and use of promotion material. **— National Constructors Association, 50 East 41st St., New York, N. Y.**

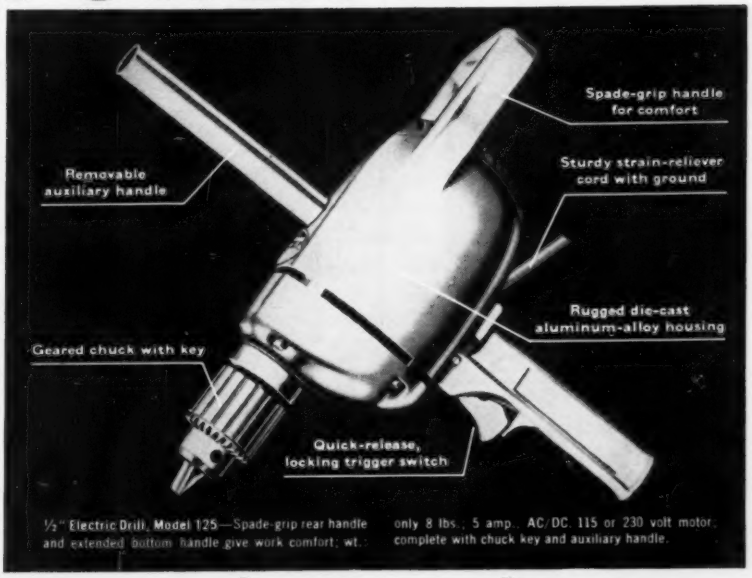
Prestressed Concrete—A 14-p booklet covers history of prestressed concrete and explains the Prescon system of post-tensioning. It includes application examples, technical data, estimated labor for placing, guide specifications and detail drawings.**—Brochure No. 2, The Prescon Corp., P. O. Box 4186, Corpus Christi, Tex.**

Concrete Admixtures — "Proper Use of Concrete Admixtures" describes several products of the Sika Corp. and gives complete instructions for selection of the right type and how to apply it. **—Sika Chemical Corp., Passaic, N. J.**

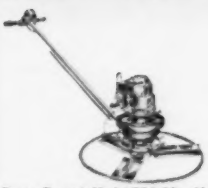
Survey Instruments — A catalog and price list of Path engineering instruments lists transits, dumpy and wye levels. These instruments are made in Japan from American designs.**—Bulletin 100-PI, Precision Instruments Inc., 1900 Fifth Ave., Troy, N. Y.**

Scraper — A 23-p booklet gives

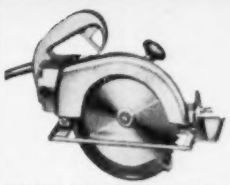
POWER to boost job efficiency with REMINGTON tools


Spade-grip handle for comfort
Sturdy strain-reliever cord with ground
Removable auxiliary handle
Rugged die-cast aluminum-alloy housing
Geared chuck with key
Quick-release, locking trigger switch

½" Electric Drill, Model 125—Spade-grip rear handle and extended bottom handle give work comfort; wt.: only 8 lbs.; 5 amp., AC/DC, 115 or 230 volt motor; complete with chuck key and auxiliary handle.



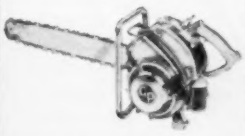
Power Trowel, Model TG4-26—2½-hp, 4-cycle, gasoline-powered engine; 26"ring size; automatic recoil starter; centrifugal clutch disengages at idle.



10" Electric Saw, Model 106—Rugged 13-amp, 115 or 230-volt AC/DC motor; cuts full 3⅜". Complete with blade, wrench and carrying case.

Concrete Vibrator, Model 7GV—A 5-hp, gasoline-powered unit from the industry's broadest line of air, electric and gasoline-driven models.

Powerful, rugged, easy to handle—Remington Power Tools help you boost output and ease the tough jobs. They're precision-built for long service and minimum maintenance. Your Remington distributor stocks and services the industry's widest selection of power tools and parts.



Golden "Logmaster" Chain Saw, 5-hp. Roller-Bearing nose boosts chain power up to 20%. Outcuts and outlasts other chain saws in its class.

Submersible Pump, Model PSP-602 with powerful air motor—completely submersible; pumps 14,000 gallons per hour against 10-ft. head.

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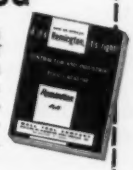

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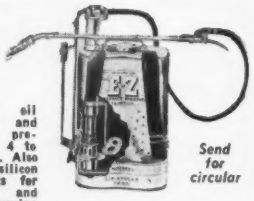
Replaces unsanitary bucket and dipper. Portable. Push button faucet. Takes cold, clean water to workers right on the job. 5 gal. steel tank is curved to fit the back. Sturdy construction. Highly popular.

E-Z
5 gal. Knapsack Sprayer



For spraying oil on machinery and equipment to prevent rust, etc. 4 to 5 gal. capacity. Also for spraying silicon water repellents for masonry work and many other spraying purposes.

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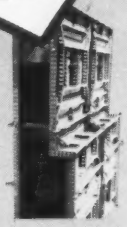

Economy Steel Forms save time, labor, material. Quickly lock together with simple twist of a clamp. Standard units fit most jobs. Where needed, special forms can be fabricated to specification.

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operating characteristics, design features, and accessories for the LeTourneau-Westinghouse Model D Tournapull.—**Copies available from local LeT-Wesco dealers.**

Truck Cranes—The entire line of Schield Bantam equipment, including cranes, excavators and attachments, is included in a new 36-p catalog.—**Form 156 R, Schield Bantam Co., Waverly, Ia.**

Stabilizers—Two new large capacity stabilizers are described in a 2-p bulletin. The machines have a capacity of up to 400 cu yd per hr and are designed to give accurate control of premixed material for road bases.—**Bulletin S-58, Hetherington & Berner Inc,, 701 Kentucky Ave., Indianapolis 7, Ind.**

Portable Power — A new folder describes the Onan portable electric power plants designed to power small electric tools or supply area floodlighting. Onan plants come as a unit rather than as separate motors and generators.—**Folder F-103, D. W. Onan & Sons, Inc., 2515 University Ave. S. E., Minneapolis 14, Minn.**

Conservation Jobs — "Conservation Work for the Conservation Contractor" is a 12-p booklet that describes some of the new opportunities for owners of earthmoving equipment in the growing business of conservation contracting.—**Form D748, Advertising Divison, Caterpillar Tractor Co., Peoria, Ill.**

Galion Grader—Bulletin 421 describes the Galion Model 160 motor grader. The heavy duty, constant mesh, six-speed transmission of this 160-hp grader, as well as other operating and construction features are described and illustrated. — **The Galion Iron Works & Mfg. Co., Galion, Ohio.**

Scaffolding—A 12-p manual tells how to use Bil-Jax scaffolding in concrete shoring work. Suggested techniques are illustrated and formulas for computing amount of equipment needed and safe working capacities are included. —**Bil-Jax, Inc., Archbold, Ohio.**

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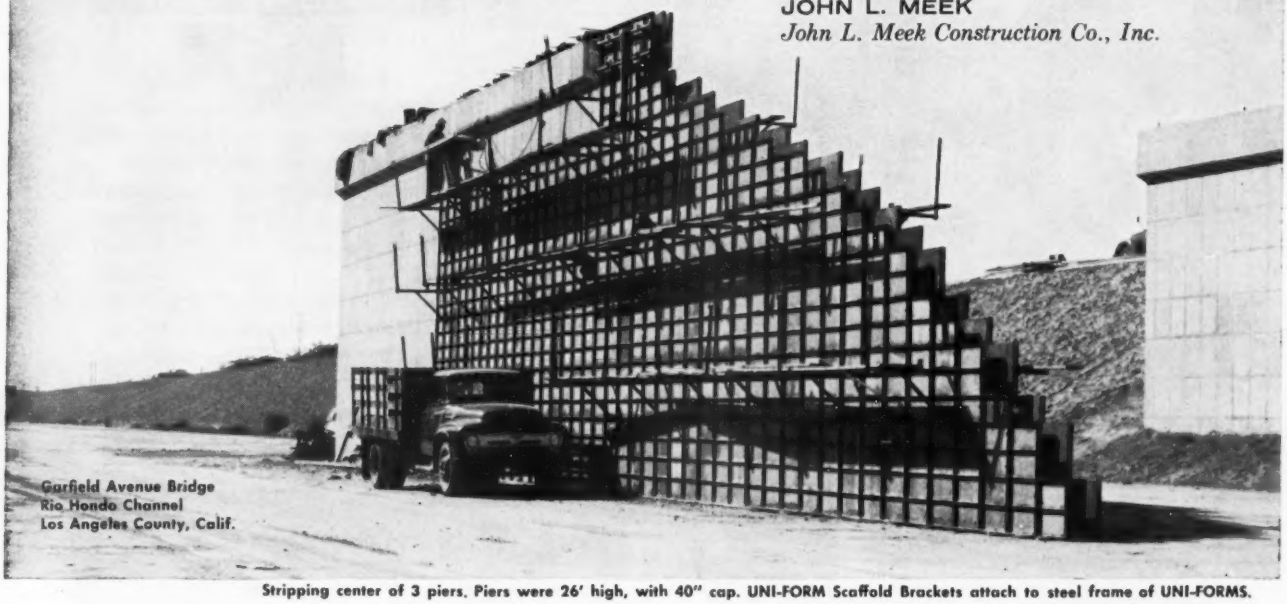

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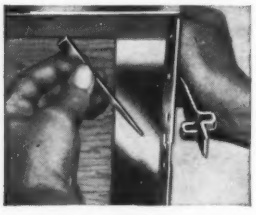
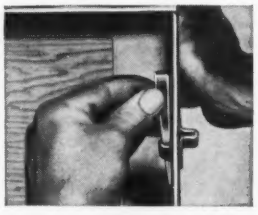


1. UNI-FORM Tie Loop is placed into the square tie hole of Panel.



2. Tie Key is set into the Tie loop. This locks tie and Panel into 1 unit.

3. Bring next UNI-FORM Panel into position. Insert Tie Key in other Tie loop. Assembly is completed.

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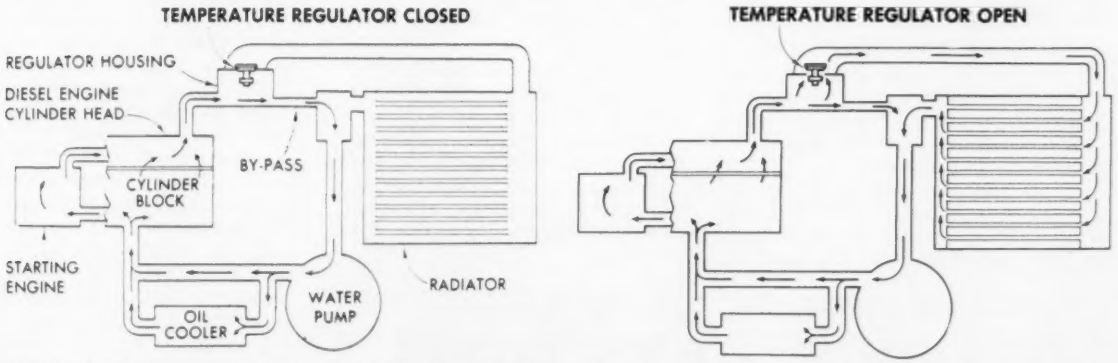

FLOW PATTERN—Arrows in drawing on left show how coolant flows through system when regulator is closed. It bypasses radiator and returns to pump. When temperature of the coolant rises above 170 deg. F., regulator opens and water flows through radiator.

Cooling System Care Pays Off

THE LITTLE TIME it takes to service cooling systems on diesel engines pays off not only in reduced down-time but also in better performance and longer engine life.

Cooling systems on most makes of earthmoving equipment are basically the same. Additions to an engine, such as an oil cooler or torque converter, may change the system—but only slightly. So the causes of overheating remain the same for most engines, and—contrary to popular opinion—the principal culprit is not always the temperature regulator.

Too often, the first thing a mechanic does when an engine overheats is pull off the regulator. "Don't jump to conclusions," warns V. A. Woodling, manager of Caterpillar's service training department. "The regulator is the watch dog of the cooling system. Many times it is unjustly accused of causing an engine to overheat. Actually, overheating can result from a number of other defects."

Before ripping off the temperature regulator, several checks can be made to see if it is responsible for overheating. Overheating usually shows up first on the temperature gage, but remember that these gages are not infallible. It takes only minutes to check water temperature with a reliable thermometer.

If the thermometer indicates the gage was correct, inspect the cooling system systematically. Begin by checking the radiator core for signs of scale, dirt, or other clogging agents. A free flow of air through the radiator fins and around the engine is essential. Inspect the radiator core fins to see if they are bent or damaged or simply plugged with mud. Other causes of overheating are a faulty water pump and a clogged water jacket or hose.

If these checks do not turn up the cause of overheating, remove the temperature regulator—but do not discard it immediately. If the engine still overheats with the regulator removed, it is not the cause of the trouble, and it should be reinstalled immediately. Should the engine run at normal operating temperatures with the regulator removed, it is proof that the regulators are at fault.

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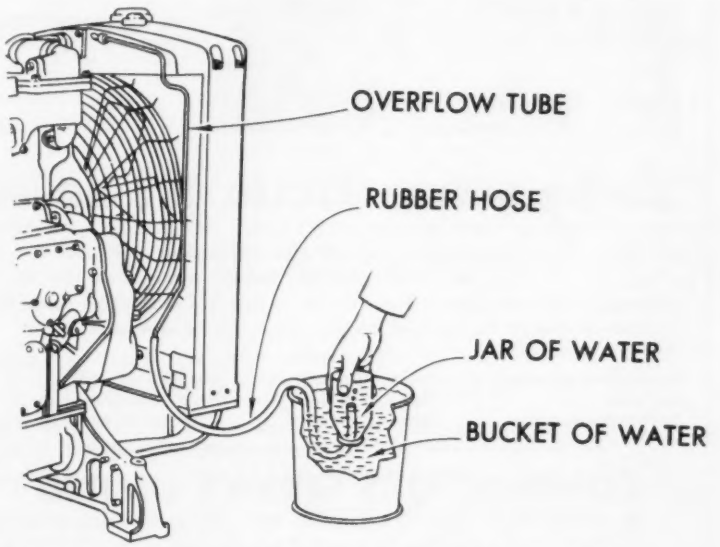

AIR CHECK—"Bottle test," described in story, tells whether the cooling system contains harmful air or gas. Components needed for the test can be found in any shop.

Air in the cooling system is another common cause of overheating that might result in serious engine damage, according to Woodling. Although air enters the system in several ways the most common reasons are a low coolant level, a loose or damaged precombustion chamber gasket, or loose head stud nuts.

A simple check, sometimes called the "bottle test," will show up excessive air in the system. Equipment needed to perform this check is readily available in any shop—a bucket of water, a length of hose that will fit over the radiator overflow tube, and a quart bottle.

To begin the test, fill the cooling system and operate the engine at high idle for at least 5 min after the engine reaches operating temperature. Then shut the engine down, make sure the radiator cap is tight, and place the hose over the end of the overflow tube.

Fill the bottle with water, insert the loose end of the hose into the bottle, and invert the bottle in the bucket filled with water. Start the engine and operate it at high idle.

The rate at which water is displaced in the bottle will determine whether excessive air or gas has leaked into the cooling system. The maximum allowable displacement rate for four and six-cylinder engines is 1 pt per min; for eight-cylinder engines the rate is 1 pt per 40 sec; and for 12-cylinder engines the maximum rate is 1 qt per min.

If water is expelled from the bottle too quickly, the source of leakage must be located and corrected. Continued operation with excessive air or gas present in the cooling system can result in damage to the entire engine.

Torque converter-equipped engines increase the load on the cooling system because they require it to remove heat from the torque converter fluid. A torque converter operates most efficiently through a certain specified speed range. When the output shaft to the torque converter operates for extended periods at speeds that are lower or higher than normal, the converter will tend to overheat due to the rapid circulation of the fluid.

Cooling systems for torque converter-equipped engines generally have the capacity to cool converter fluid, but certain operating principles must be followed. Never allow the engine to operate at or near high idle speed with the torque converter input shaft coupled to the engine and no load on the output shaft. This can result in overheating in a matter of minutes. Heating will also occur when the engine is operating at low idle speed with the torque converter coupled to the engine.

If the torque converter is equipped with a clutch, the clutch should always be disengaged when the engine is idled. For torque converters not equipped with a clutch, experience will determine how long an engine may be safely idled at low speed before overheating will result.

In most cases, overheating of this type can be prevented by watching the torque converter temperature gage, and, when necessary, by shifting gears or readjusting the load or engine speed.

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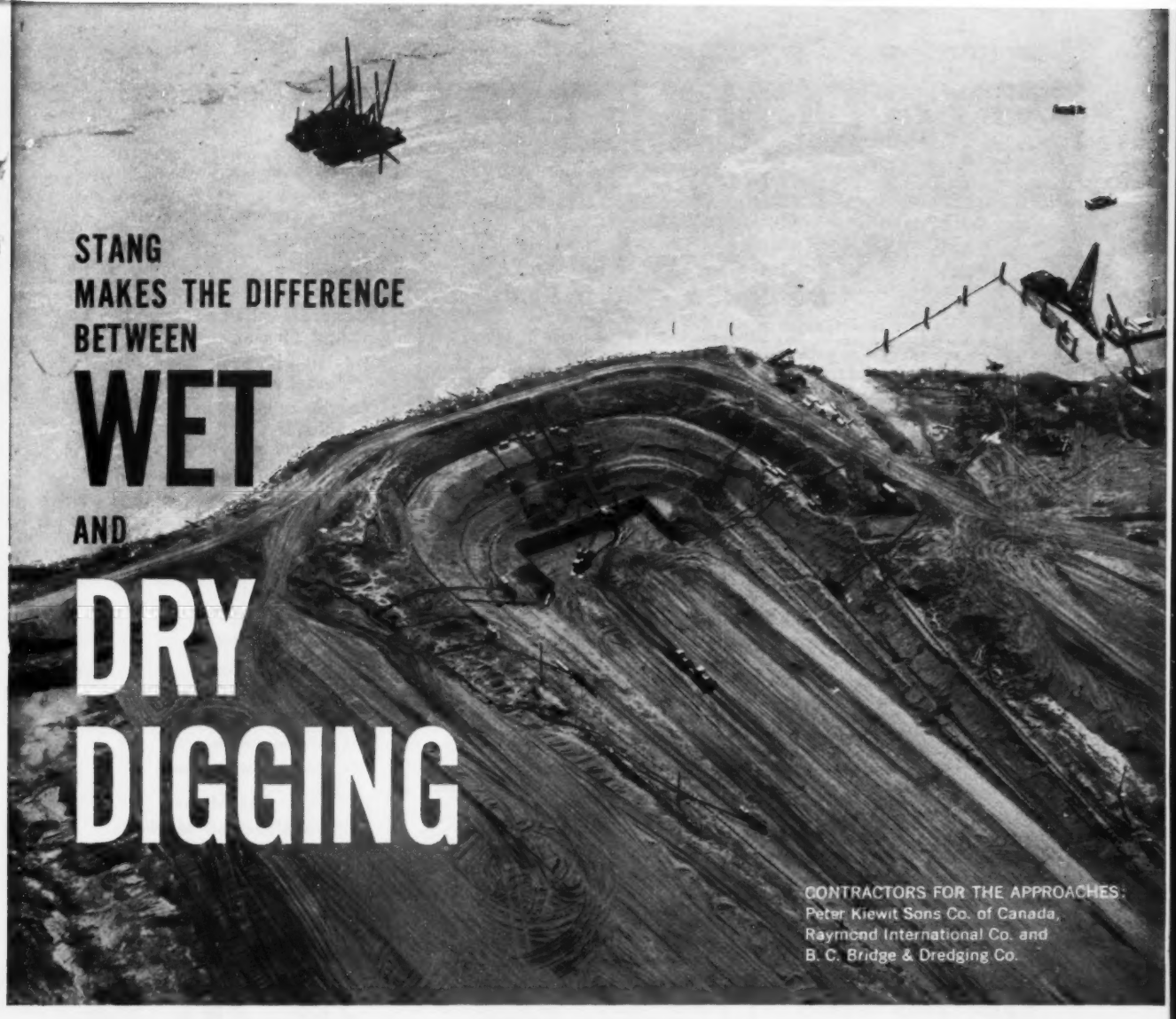

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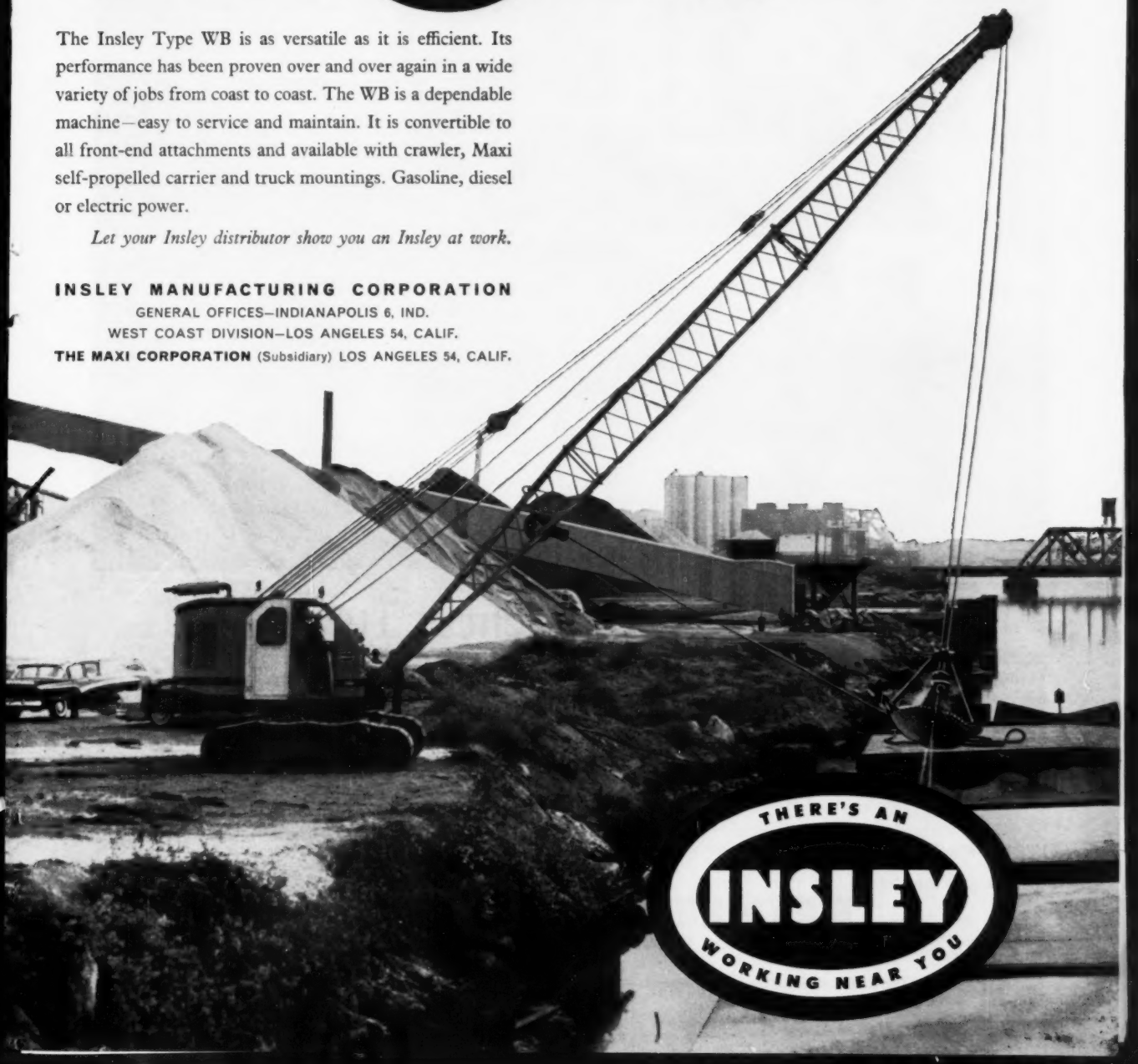

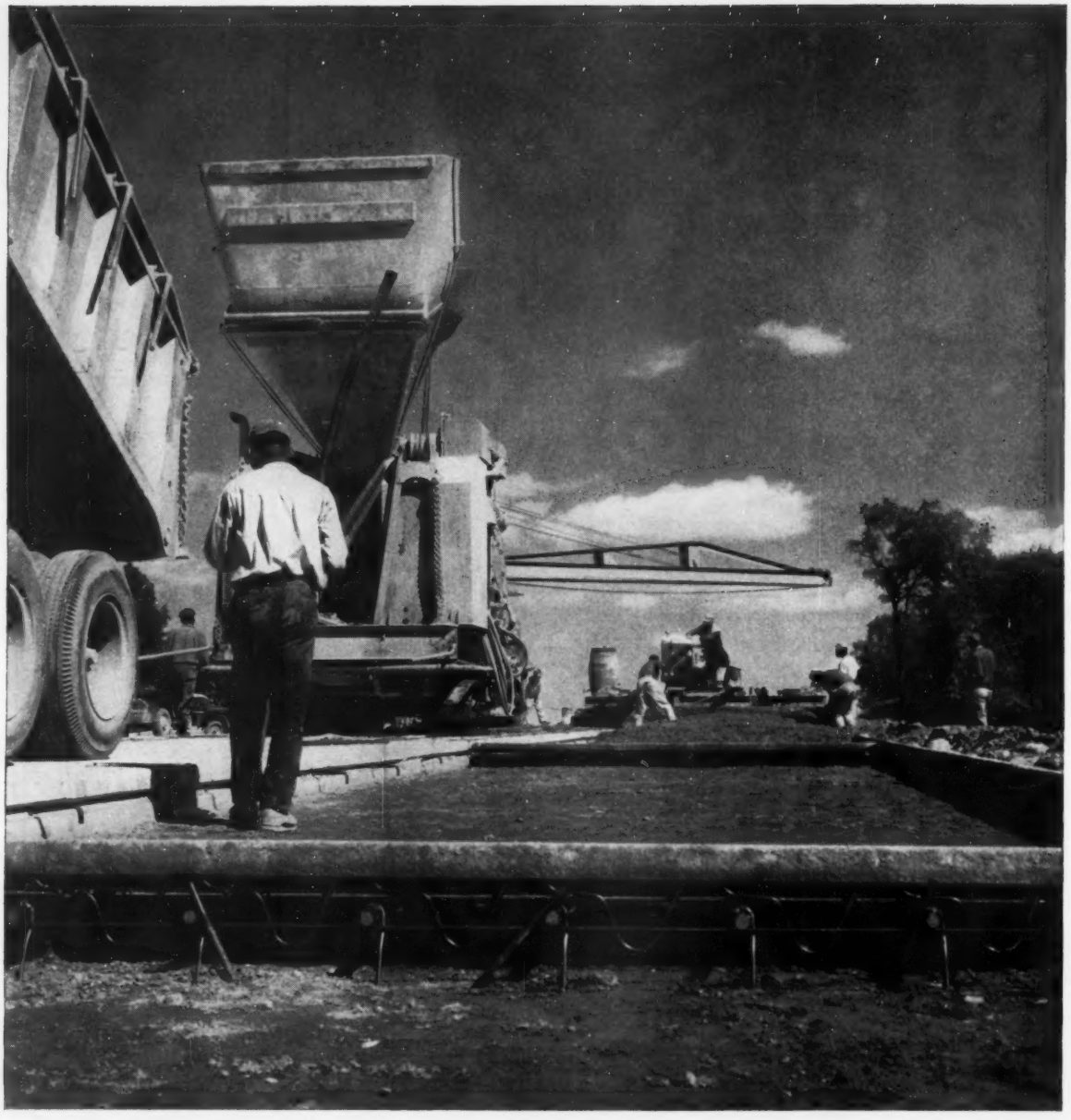

Paving the Connecticut Turnpike

Paving operations were in full swing when this picture was taken along the portion of the Connecticut Turnpike west of New Haven. Here the turnpike will be a six-lane, divided expressway of reinforced concrete, with 12-ft lanes and curves not exceeding three degrees. Grades are three per cent or less.

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Methods Memo . . .

Why No Ice?

In temperatures as low as 30 deg below zero, the work area is ice-free and construction continues on these bridge piers 140 miles north of Toronto.

The secret is an underwater aeration process that prevents ice formation and permits floating construction equipment to operate.

Dravo of Canada, Ltd., adopted the system to build the substructure for a four-lane highway bridge across Vernon Lake Narrows at Huntsville, Ontario. The site usually is covered with ice for about four months each winter.

Dravo laid a 1½-in.-dia plastic pipe with 1/16-in. holes at 10-ft intervals across the floor of the channel. As the pipe was played out from a derrick boat, they added concrete weights at 20-ft intervals to hold it on the bottom. An Ingersoll-Rand compressor on the shore feeds air into the pipe. Air escaping through the holes in the pipe forces the warmer water at the bottom of the channel to the surface and causes some turbulence. This prevents ice from forming.

Dravo has two derrick boats, a barge, and a ferry at work building eight concrete piers and two abutments for the 810-ft span. Concrete comes from a 1-yd mixing plant on shore. An air-powered transfer buggy shifts it to buckets on the ferry.

Russians Shoot for Record

The Russians are planning a construction blast that will make the biggest shots ever fired to date look puny.

They plan to blast out a new river channel five miles long with a single shot. A Soviet weekly publication says the blast will be fired next year in the bed of the River Angara at Lake Baikal.

It will require 60,000,000 lb of explosive and will move about 9,150,000 cu yd of rock. The publication says the explosive will be laid in a tunnel under the river with access from the river banks through 28 shafts.

The biggest construction blast on record was fired last January by Morrison-Knudsen Co., Inc., at Promontory Point, Utah. It took 2,138,000 lb of explosive (CM&E Feb. p. 248).

The new channel will allow the reservoir of the Bratsk hydroelectric station, now under construction, to fill up quickly without halting navigation on the lower reaches of the river.

Shock of the huge explosion, the publication says, will spread out only about one mile from the center of the blast. Water in Lake Baikal and in the river are expected to absorb a major part of the shock. But Russian engineers are considering establishment of an electric field around the area to drive fish into safer water.

Low Bids

Pittsburgh got a pleasant surprise when low bids for construction of the new Civic Auditorium added up to slightly less than $15.5 million instead of the $17 million predicted in engineering estimates.

Low bidders for the two principal contracts were Dick Corp. of Large, Pa., with a bid of $5.9 million for excavation, foundation, and structural work and American Bridge Division of U.S. Steel Corp. with a bid of $4 million for structural steel work.

The auditorium will have the world's largest retractable dome—a metal roof 415 ft in dia and high enough to cover a 10-story building. It can be rolled back in 3 min. The auditorium will serve as a sports arena and convention hall.

It is part of a projected development that will replace 95 acres of slums at a total cost of more than $100 million if the entire plan is approved.

Fishing and Highways

What has highway construction got to do with fishing? Well, quite a lot according to Fisherman magazine. In an editorial entitled, "Roads, Rocks, and Ruin," the publication says the stepped-up federal road building program could ruin a lot of good fishing in the U.S.

The magazine points out that the highway program will require about 10,000,000,000 tons of gravel. If this gravel is dredged from stream beds without some sort of control, it may result in the destruction of valuable fish spawning beds.

As an example of the importance of gravel to the fish, the article says some gravel bars in California are estimated to be worth at least $20,000 an acre as spawning beds for trout and salmon. It says the Bureau of Public Roads recognizes the danger and has begun to distribute information of the fishery values of gravel beds.

Among the states, Michigan is a leader in this type of conservation. The Michigan State Highway Department clears plans for highway construction with the state's Conservation Department in an effort to avoid damage to wildlife and fisheries.

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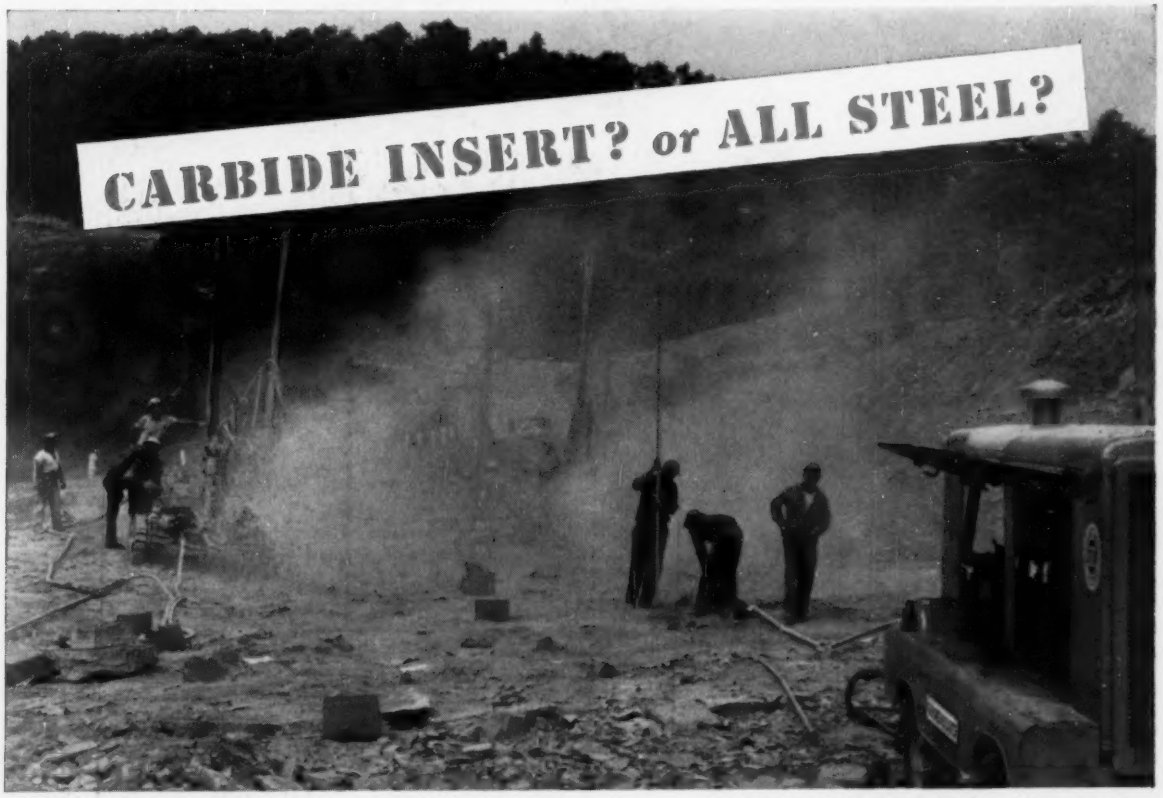

LOCATION: Route 40, Martins Mountain, Cumberland, Md. **OPERATING CONDITIONS:** Medium limestone.

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